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ABSTRACT

Defined in this glossary are nearly 800 terms related to energy and conservation. Space provided at the end of each alphabetic section allows users to add new words and definitions. This publication is part of a set of resources prepared for teachers by "Energy and Man's Environment." (Author/WB)

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ENERGY & CONSERVATION GLOSSARY

energy (en′-ər-jē) in scientific terms, the capability or capacity of doing work.

At one time or another, nearly all students memorize this or a similar definition for energy. To most, the definition has little meaning. It does not explain what energy is. It reveals very little of the nature of energy or the essence of the complex concept.

There is no one definition which can adequately describe energy, any more than there is one definition which adequately describes "truth". This is largely due to the fact that energy is not tangible; it is not an object. It is, rather, a term describing an elusive agent which reveals itself in a variety of forms. As a concept, it describes how and why activity occurs or conditions exist. Without energy, nothing would ever happen! All processes would halt. Energy is, in an absolute sense, the universal "glue" that binds into order the elements of the living and nonliving world.

Understanding the concept of energy requires much more than memorization of a definition from a dictionary or glossary. Understanding requires a perception of energy forms — (electrical, thermal, chemical, gravitational, nuclear, light). Understanding requires knowledge of the sources of these forms of energy; their conversions, applications, limitations, impacts and management. When these are internalized, we can say that an individual is energy literate.

When we speak of an "energy crisis" we acknowledge the fact that many presently used sources of energy are rapidly disappearing and cannot be replenished. Finding new sources of usable energy takes time. We are running out of time. We must conserve our energy resources by reducing waste and managing our rate of use. Unless we do this now, there may not be a desirable future for us, for our children, or for the generations to come. As educators, we can neither safely ignore nor escape our responsibility for the future.

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THIRD EDITION

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ACKNOWLEDGEMENT

This is the third edition of the EME GLOSSARY. There are over 500 new entries, with a total of nearly 800 terms and definitions. The GLOSSARY was revised and expanded according to the recommendations of a group of energy and conservation experts. Members of the evaluation and writing team were Dr. John Amend, Montana State University; Dr. Richard Dawson, University of Kansas; Dr. Michael Fiasca, Portland State University (Oregon); Dr. Wayne Hager, University of Idaho; Dr. Mario Iona, University of Denver; and Dr. Ron Lamb, Southern Oregon State College. The final draft was prepared by Anita Jones.

PURPOSE

A glossary is, well, a glossary . . . unless you use it as a teaching tool. The ENERGY & CONSERVATION EDUCATION GLOSSARY is special because it focuses on the many energy and conservation terms which have in recent years assumed new importance for all of us. It will certainly help you identify the meaning of these words.

What else can this GLOSSARY do? Several possibilities come to mind. First, it is part of an interrelated set of energy and conservation resources prepared for teachers by Energy & Man's Environment. The GLOSSARY will provide easy reference to the terms which appear in the related materials. In addition, innovative teachers know that energy and conservation concerns are of considerable interest to nearly everyone, especially students. As such, the GLOSSARY provides a useful resource for teaching basic skills. Hiding in this innocent volume are a wide variety of organizing, classifying, and related learning opportunities. Add interest to your instruction by using the ENERGY & CONSERVATION GLOSSARY to create word search games, crossword puzzles, and other language and word power experiences.

USING THE ENERGY & CONSERVATION EDUCATION GLOSSARY

The GLOSSARY terms are arranged alphabetically. In addition, space has been provided at the end of each alphabetic section so that you can add new words and definitions. If you would like to propose new words, or suggest changes in existing content, please use the forms provided for that purpose at the end of the GLOSSARY.

Many of the terms included in this GLOSSARY have multiple meanings. Only those definitions directly or indirectly related to energy and conservation education have been included.

ENERGY & MAN'S ENVIRONMENT

Energy & Man's Environment is a nonprofit educational corporation. Its purpose is to help educators understand the nature and extent of the energy dilemma and its educational implications. To accomplish this purpose, EME develops and supports balanced and objective programs designed to achieve energy literacy.

A

ABATEMENT: The act of reducing the degree or intensity of any condition, such as pollution.

ABSORPTION: The entering of radiation or another substance into a material without being reflected or released.

ACCELERATOR: In radiology and nuclear physics, a device for imparting high velocity to subatomic particles such as electrons or protons.

ACCLIMATION: The physiological and behavioral adjustments of an organism to changes in its immediate environment.

ACCLIMATIZATION: The acclimation or adaptation of a particular species over several generations to a marked change in the environment.

ACID RAIN: Any form of precipitation having a PH less than 5.6 on a scale of 0-14. Pure water (PH 5.6) becomes acidic through the addition of chemicals from natural or man made sources.

ACRE-FOOT: A quantity of water that would cover 1 acre 1 foot deep. Contains 43,560 cubic feet, 1,233 cubic meters, or 32,580 gallons (U.S.).

ACTIVATED CARBON: A highly adsorbent form of carbon, used to remove odors and toxic substances from gaseous emissions. In advanced waste treatment, activated carbon is used to remove dissolved organic matter from waste water.

ACTIVATION: The process of making a material radioactive by bombardment with neutrons, protons, or other nuclear particles or photons.

ACTIVE SOLAR SYSTEM: See SOLAR, ACTIVE

ADAPTATION: A change in structure or habit of an organism that produces better adjustment to the environment.

ADSORPTION: The adhesion of a substance to the surface of a solid or liquid. Adsorption is often used to extract pollutants by causing them to be attached to such adsorbents as activated carbon or silica gel. Hydrophobic, or water-repulsing adsorbents, are used to extract oil from waterways in oil spills.

AERATION: Bubbling air through a solution; cleaning water of impurities by exposure to the air.

AEROBIC: Living, active, or occurring only in the presence of oxygen.

AFTERBURNER: An air pollution abatement device that incinerates products of combustion and removes undesirable organic gases through incineration.

AFTERCOOLING: The cooling of a reactor after it has been shut down.

AFTERHEAT: The heat produced by the continuing decay of radioactive atoms in a reactor after fission has stopped.

AIR CHANGES: Replacement of air in a room over a period of time. Often in cubic feet per minute (CFM).

AIR CURTAIN: A method for mechanical containment of oil spills. Air is released from perforated pipes and rises in bubbles in the water. This causes an upward water flow that retards the spreading of oil. Air curtains are also used as barriers to prevent fish from entering a polluted body of water.

AIR POLLUTION: The presence of contaminants in the air in concentrations that prevent the normal ability of the air to clean itself, and that interfere directly or indirectly with the health, safety or comfort of organisms, or with the full use and enjoyment of property.

AIR POLLUTION EPISODE: The presence of abnormally high concentrations of air pollutants usually occurring during periods of low winds and temperature inversion, which may result in illness and death. See **INVERSION**.

AIR SAMPLING: The collection and analysis of samples of air to measure or to detect the presence of radio-active substances, particulate matter, or chemical pollutants.

ALLOCATION: The apportionment of shares of fuel or electricity (based on availability, estimated rates of consumption, and priority of use).

ALPHA PARTICLE: A positively charged particle emitted by certain radio-active materials. The least penetrating of the three common types of nuclear radiation (alpha, beta, and gamma), alpha particles can be stopped by a sheet of paper. When produced by plutonium decay, the particles are extremely dangerous if inhaled.

ALTERNATING CURRENT (AC): An electric current with its direction reversed at regular intervals. Electric current in the U.S. alternates with a frequency of 60 hertz, or cycles per second. Some European countries use 50 hertz.

AMBIENT AIR: Surrounding air.

AMMETER: An instrument for measuring th strength of an electric current.

AMPERE: A unit of measure of electric current. One ampere equals 6.2×10^{18} electrons passing a point in 1 second.

ANAEROBIC: Refers to life or processes that occur in the absence of oxygen.

ANEMOMETER: An instrument used to determine wind speed.

ANIMAL WASTE CONVERSION: The process of obtaining oil, gas or other materials from animal wastes.

ANTHRACITE: "Hard coal," appearing bright and shiny, generally found deeper in the earth than bituminous. Used as a fuel in household heating systems. Anthracite produces almost no smoke when it burns.

API GRAVITY: A measure of density used to characterize crude oil. The highest energy oil has the highest API rating and the lowest density.

APPLIANCE SATURATION: Ratio of the number of homes using a specific appliance to the total number of homes.

AQUIFER: An underground bed or stratum of earth, gravel or porous stone that contains water.

AREA SOURCE: In air pollution, any small individual fuel combustion source, including any transportation sources. Area Source is legally and precisely defined in Federal regulations. See **POINT SOURCE.**

ASH: The residue which remains after complete burning (or oxidation) of a combustible material.

ASPHALT: A brown to black solid or semisolid bituminous substance manufactured or occurring in nature.

ASSIMILATION: Conversion or incorporation of absorbed nutrients into protoplasm. Also refers to the ability of a body of water to purify itself of organic pollution.

ATMOSPHERE: The air. The layer of gases surrounding the earth.

ATOM: The smallest parts of an element that are alike, unless further dividing produces identical particles (as in O_2). The smallest particle of an element which can enter into a chemical combination. All chemical compounds are determined by the nature, number, and arrangement of the component atoms in their molecules.

ATOMIC ENERGY: (see NUCLEAR ENERGY).

ATOMIC PILE: A nuclear reactor.

ATP (ADENOSINE TRIPHOSPHATE): The energy carried in most reactions that take place in living systems. The major source of usable energy in organisms.

ATTRITION: Wearing away or weakening, as in the act of grinding down by friction.

AUTOTROPHS: Organisms that can synthesize their own energy-containing food stuffs using the sun as an energy source.

Write additional "A" words here:

B

BACKGOUND LEVEL: Amount of pollutant present in the ambient air due to natural sources.

BACKGROUND RADIATION: The radiation from radioactive materials in the environment and cosmic rays from space. Such radioactive materials exist everywhere – in the air, in the earth, and in human-made materials that surround us.

BACKSCATTER: When radiation of any kind strikes matter (gas, solid or liquid), some of it may be reflected or scattered back in the general direction of the source.

BAFFLE: Any air deflector device used to change the direction of flow or the velocity of water, sewage or products of combustion such as fly ash or coarse particulate matter. Also used in deflecting sound.

BAGHOUSE: An air pollution abatement device containing large fabric bags (usually made of glass fibers) through which gas streams are filtered, trapping particulates.

BALING: A means of reducing the volume of solid waste by making it more compact.

BARREL (bbl): A liquid volume measure equal to 42 U.S. gallons (159 liters). Although seldom stored in actual "barrels," crude oil is measured in a unit called the barrel. One barrel of crude oil has the same energy as 350 pounds of coal.

BARRELS PER DAY OIL EQUIVALENT (B/DOE): A measurement applied to energy sources other than oil for the purpose of making more direct comparisons.

BASE: A selected time unit with consumption level or dollar amounts to which all future usage or costs are compared.

BASE LOAD: The minimum demand on an electric or gas utility over a given period of time.

BATT: See **BLANKET INSULATION**.

BATTERY, STORAGE: A device which stores energy by converting electrical energy into chemical energy. This energy can be reconverted to electrical energy by the reversal of the chemical reactions.

BEDROCK: The part of the earth's crust that is almost unbroken rock, and is relatively unaffected by the process of erosion.

BENEFIT-COST RATIO (B/C): The ratio of the discounted benefits to discounted costs.

BENZENE (C_6H_6): A colorless liquid hydrocarbon made from coal tar. Used in the manufacture of styrene, nylon, detergents and other compounds. It is also a component of high-octane gasoline.

BETA PARTICLE: An elementary particle (electron or positron) usually negatively charged, which is emitted in radioactive decay. It is easily stopped by a thin sheet of metal.

BIOASSAY: The employment of living organisms to determine the biological effect of some substance, factor or condition.

BIOCHEMICAL OXYGEN DEMAND (BOD): A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. Large amounts of organic waste use up large amounts of dissolved oxygen; thus the greater the degree of pollution, the greater the BOD.

BIOCONVERSION: A general term describing the conversion of one form of energy into another by plants or microorganisms. Example: digestion of solid wastes or sewage sludge by microorganisms to form methane.

BIODEGRADABLE: Having the potential of being broken down into small molecules by the action of living microorganisms, including bacteria and fungi.

BIOLOGICAL DOSE: The radiation dose absorbed by biological material. Measured in rems.

BIOLOGICAL SHIELD: A mass of absorbing material placed around a reactor or radioactive source to reduce the radiation to a level safe for humans.

BIOMASS: The total amount of biological material in a given area.

BIOMONITORING: The use of living organisms to measure the effects of a change in the environment.

BIOSPHERE: The portion of the earth and its atmosphere capable of supporting life.

BIOTA: All the species of plants and animals occurring within a certain area.

BIOTIC COMMUNITY: A group of plants, animals, and microbes living together and depending on each other for food, shelter, etc.

BITUMEN: A general name for various solid and semisolid hydrocarbons.

BITUMINOUS COAL: "Soft coal," containing between 15 and 50 percent volatile matter. It is "younger" and of lower heat value than anthracite. It is the chief fuel in plants that generate electrical energy with steam.

BITUMINOUS ROCK: A rock containing hydrocarbons or bituminous material.

BLACKOUT: A total power failure caused unintentionally by storm damage, equipment failure, or overloading utility equipment. An exceptional situation in which all power is deliberately cut off by electrical generating facilities.

BLACK LUNG DISEASE: A disease common among coal miners, caused by the inhalation of coal dust in quantities in excess of the lungs' cleansing ability. It eventually leads to cell damage that produces a form of emphysema.

BLANKET INSULATION: Cotton fiber, mineral wool, or wood fiber made into varying thicknesses and lengths for heat insulation purposes.

BLOWDOWN: Water drawn from boiler systems and cold water basins of cooling towers to prevent buildup of solids concentrations. Usually contains chemicals used for pH adjustment and slime control.

B.O.E.: Barrel of Oil Equivalent: a unit of energy equivalent to the energy in a barrel of crude oil or 5,800,000 BTU's.

BOILER: Equipment which burns fuel or collects the sun's rays. Creates high temperatures to convert water to steam in order to produce electricity.

BOILER EFFICIENCY: The ability of a unit to convert a form of energy (gas, oil, or coal) to heat energy at the highest possible rate; i.e.: 80-85 percent efficiency should be an attainable goal.

BOILING: Heated to the boiling point; the temperature at which a liquid generates bubbles and converts to vapor.

BOILING POINT: The temperature at which a liquid boils. The temperature at which the vapor pressure of a liquid equals the pressure on its surface. If the pressure of the liquid varies, the actual boiling point varies.

BOILING WATER REACTOR (BWR): A nuclear reactor in which water, used as both coolant and moderator, is allowed to boil in the core. The resulting steam can be used directly to drive a turbine generating electric power.

BOOM: A floating device that is used to contain oil and other floating matter on a body of water.

BOTTOMING CYCLE: A means of using the low-temperature heat energy exhausted from a heat engine, as in a steam turbine.

BREEDER REACTOR: A nuclear reactor that creates more fissionable fuel than it consumes by converting non-fissile uranium 238 into fissile plutonium 239.

BRINE: Water saturated with salt.

BRITISH THERMAL UNIT (BTU): The standard unit for measurement of the amount of heat energy, such as the heat content of fuel. Equal to the amount of heat energy necessary to raise the temperature of one pound of water one degree Fahrenheit. One BTU equals 252 calories, 1055 joules, and 0.293 watt-hours.

BROWN COAL: Brownish-black coals that contain about one-half water. Lignite is the harder type of brown coal. Large deposits of lignite are found in the northwestern U.S. and in western Canada.

BROWNOUT: The deliberate lowering of voltage (and thus the power supplied to all users) by electric utility companies when demand for power exceeds generating capacity.

BTU: (see BRITISH THERMAL UNIT)

BUILDING ORIENTATION: The arrangement of a building in relation to sun exposure, prevailing winds, etc.; affects heat loss and gain in building.

BURN-UP (NUCLEAR): A measure of the consumption of nuclear fuel in a nuclear reactor. Fuel burn-up may be expressed in terms of total energy extracted from the fuel during its stay in the reactor, or in terms of percentage of the fuel consumed over that period.

BUSBAR: An electrical conductor in the form of rigid bars located in a switchyard or power plant, serving as a common connection for two or more electrical circuits.

BUTANE (C_4H_{10}): At one time the principal component in bottled gas. Refiners are now channeling it into the manufacture of petrochemicals.

Write additional "B" words here:

C

CADMIUM SULFIDE (CDS): A material used in the manufacture of solar cells because it is capable of converting sunlight to electrical energy.

CALORIE (cal.): (1) a unit of heat energy equal to the amount of heat that will raise the temperature of one gram of water one degree Celsius. The calorie is used when temperature is measured on the Celsius scale, while the British Thermal Unit is used when the measurement is on the Fahrenheit scale. One calorie equals 4.18 joules. (2) An amount of food having the energy-producing value of one calorie.

CAPABILITY: The maximum load which a generator, turbine, power plant, transmission circuit, or power system can supply under specified conditions for a given time interval without exceeding approved limits of temperature and stress.

CAPACITY: In electric generation, the load for which a generator, transmission circuit, power plant, or system is rated. Capacity is also used synonymously with capability.

CARBOHYDRATE: An organic compound such as sugar, starch, etc. used as a source of energy in organisms.

CARBON DIOXIDE (CO_2): A colorless, odorless, toxic gas that is a normal part of the ambient air. CO_2 is a product of fossil fuel combustion as well as a product of the respiration of organisms.

CARBON MONOXIDE (CO): A colorless, odorless, highly toxic gas that is a normal byproduct of incomplete fossil fuel combustion. CO, one of the major air pollutants, can be harmful in small amounts if breathed over a certain period of time due to its capacity to bind to hemoglobin in red blood cells and therefore exclude oxygen.

CARCINOGEN: A chemical or form of radiation (energy) which either directly or indirectly causes cancer.

CARNIVORE: An organism that obtains its food energy by eating animals.

CARPOOL: A group of people who agree to travel together in one car to their place of work, study, or other destination in order to save money and gasoline. See VANPOOL.

CARTEL: A group acting to control the price of its product.

CASK: A container used for the transporation of radioactive materials.

CATALYST: A substance which, when added to a chemical reaction, increases its rate but is not consumed in the reaction. A catalyst may eventually need to be replaced because it loses its effectiveness or is contaminated, but not because it becomes depleted in the reaction.

CATALYTIC CONVERSION: One of several processes for producing a liquid fuel from coal. It involves the combining of CO and H_2 under pressure and in the presence of a catalyst.

CATALYTIC CONVERTER: A device added to the exhaust system of motor vehicles which converts the air pollutants, carbon monoxide (CO) and hydrocarbons, to carbon dioxide (CO_2) and water.

CAULKING: The filling of cracks with a solid material such as plastic.

CCF: A hundred cubic feet. Used as a measure by natural gas companies for billing purposes.

CELSIUS (°C): A metric temperature scale on which the freezing point of water is 0 degrees and the boiling point of water is 100 degrees. The formula for converting a Celsius temperature to Fahrenheit is $°C = 5/9 (°F-32)$.

CENTRIFUGAL COLLECTOR: Any of several mechanical systems using centrifugal force to remove particles from a gas stream.

Cfm: Cubic feet per minute. Usually refers to air change.

Cfs: Cubic feet per second.

CHAIN REACTION: A nuclear reaction that stimulates its own repetition. In a fission chain reaction, a fissionable nucleus absorbs a neutron and divides, releasing additional neutrons. These in turn can be absorbed by other fissionable nuclei, releasing still more neutrons. A fission chain reaction is self-sustaining when the number of neutrons released equals or exceeds the number of neutrons lost by absorption in nonfissionable material or by escape from the system.

CHAR: The solid, carbonaceous residue that results from the incomplete combustion of organic material. It can be burned for its energy content or, if free from large amount of impurities, processed further for production of activated carbon for use as a filtering medium. Char produced from coal is generally called coke, while that produced from wood or bone is called charcoal.

CHEMICAL: (1) Of, relating to, used in, or produced by chemistry; (2) acting or operated or produced by chemicals; (3) a substance (as an element or chemical compound) obtained by a chemical process or used for producing a chemical effect.

CHEMICAL ENERGY: A form of energy which may be released when a chemical reaction takes place.

CHEMICAL REACTION: A chemical change.

CHILLING EFFECT: The lowering of the earth's temperature due to the increase of atmospheric particulates that inhibit penetration of the sun's energy.

CHINA SYNDROME: A figure of speech which refers to the total meltdown of the core of a nuclear reactor. Refers to the concept that the meltdown would continue to melt through the earth to China.

CHLOROPHYLL: The chemical substance that gives green plants their color and helps them carry on photosynthesis.

CHLOROPLAST: The microscopic structure in green plants responsible for converting light energy into chemical energy. It contains chlorophyll.

CIRCUIT: The complete path transversed by an electric current.

CIRCUIT BREAKER: An automatic switch which breaks the circuit when too much electric current is flowing. It is similar to a fuse, but it can be reused or reset.

CLADDING: The outer jacket of nuclear fuel elements. It prevents corrosion of the fuel by the coolant and the release of fission products into the coolant. Aluminum or its alloys, stainless steel and zirconium alloys are common cladding materials.

CLOCK-ACTUATED THERMOSTAT: Automatically changes the thermostat between two settings at predetermined times, permitting the temperature to be automatically reduced in the evening.

COAL: A solid, combustible, organic hydrocarbon formed by the decomposition of vegetable material without free access to air.

COAL GAS: An artificial gaseous fuel produced by heating coal in the absence of oxygen. This fuel, known as manufactured gas, can supply about 450 BTUs per cubic foot. Use of coal gas in the U.S. ceased when inexpensive natural gas became widely available. Usually toxic if inhaled.

COAL GASIFICATION: The conversion of coal to a gas suitable for use as a fuel.

COAL LIQUEFACTION (COAL HYDROGENATION): The conversion of coal into liquid hydrocarbons and related compounds by hydrogenation. The process involves treating coal with oil and hydrogen under heat and pressure, then separating the liquid mixture into useful products.

COAL, LOW SULFUR: Generally, coal that contains one percent or less of sulfur by weight.

COAL SEAM: A bed of coal usually thick enough to be mined with profit.

COAL SLURRY PIPELINE: A pipeline which transports pulverized coal suspended in water.

COAL TAR: A gummy black substance produced as a by-product when coal is distilled.

COEFFICIENT OF PERFORMANCE (COP): The ratio of the useful heating or cooling performance of a device or system to the energy required to operate it. Usually applied to a heat pump.

COGENERATION: Using industrial waste heat to generate electrical power, thus saving energy from other sources.

COKE: Degassed coal. A porous, solid residue resulting from the incomplete combustion of coal heated in a closed chamber, or oven, with a limited supply of air. More like pure carbon than coal, coke is a desirable fuel in certain industries. (see CHAR).

COLD SHUTDOWN: A nuclear-reactor condition in which the coolant temperature has been reduced to 200°F or below and the pressure has essentially been reduced to atmospheric pressure.

COMBINATION UTILITY: A utility which supplies both a gas and some other utility service (electricity, water, etc.).

COMBINED-CYCLE PLANT: A plant which utilizes waste heat from large gas turbines (driven by gases from combustion of hydrocarbon fuels) to generate steam for conventional steam turbines.

COMBUSTION: The burning of a substance. Technically, a rapid oxidation accompanied by the release of energy in the form of heat and light. Combustion, attrition, and vaporization are the basic factors causing air pollution.

COMFORT AIR CONDITIONING: The process of treating air to control simultaneously its temperature, humidity, cleanliness, and distribution.

COMFORT ZONE: The proper combination of temperature, humidity, and air movement to create a feeling of comfort.

COMMINUTION: Mechanical shredding or pulverizing of waste, a process that converts it into a more uniform manageable material.

COMPACTION: Reducing the bulk of solid waste by rolling or tamping.

COMPOST: Relatively stable decomposed organic material.

COMPOSTING: A controlled process of degrading organic matter by microorganisms. (1) mechanical – a method in which the compost is continuously and mechanically mixed and aerated. (2) ventilated cell – compost is mixed and aerated by being dropped through a vertical series of ventilated cells. (3) window – an open air method in which compostable material is placed in windows, piles or ventilated bins or pits and occasionally turned or mixed. The process may be anaerobic or aerobic.

COMPOUNDS: Substances containing more than one constituent element and having properties, on the whole, different from those which their constituents had as elementary substances. The composition of a given pure compound is perfectly definite, and is always the same no matter how that compound may have been formed.

COMPRESSED AIR STORAGE: A storage system in which a gas turbine compressor is operated during off-peak hours and the compressed air is stored in natural caverns, old oil or gas wells, or porous rock formations.

CONDENSATE: Liquid hydrocarbon obtained by the combustion of a vapor or gas produced from oil or gas wells and ordinarily separated at a field separator and run as crude oil.

CONDENSATION: The change from gas to liquid.

CONDENSER: In a nuclear reactor, a mechanism for converting steam back to water by extracting heat so that the water can be returned to the reactor vessel.

CONDENSER COOLING WATER: Water required to condense steam after its discharge from a steam turbine.

CONDUCTION, THERMAL: The transmission of heat through a substance from places of higher to places of lower temperature.

CONDUCTOR (ELECTRICAL): A material capable of carrying an electrical current.

CONSERVATION: (1) The constancy of a quantity in all interactions; (2) The preservation or wise use of resources.

CONSERVATION OF MATTER AND ENERGY (Law of): The total amount of energy and matter in the universe remains constant.

CONSERVATION OF MECHANICAL ENERGY (Law of): The sum of the potential and kinetic energy of an ideal energy system remains constant.

CONSERVE: To manage or use wisely.

CONSUMERS: (1) A person or thing that consumes; specifically, a person who buys goods or services for his/her own needs; (2) Organisms that get their energy by eating other organisms; the second trophic level on an ecological pyramid.

CONTAINMENT BUILDING: An airtight structure which is typically made of steel-reinforced concrete three feet thick. It houses the nuclear reactor, reactor coolant pumps, steam generator, and other equipment or piping containing reactor coolant. Designed to prevent the escape of radioactive materials into the atmosphere.

CONTAINMENT VESSEL: A gas-tight shell or other enclosure around a nuclear reactor core.

CONTAMINANT: A substance which makes another substance (air, water, etc.) impure, unclean, radioactive, or unfit for use.

CONTRACT DEMAND: The demand that the supplier of electric service agrees to have available for delivery.

CONTROL ROD: A device within a nuclear reactor which absorbs neutrons. When a control rod assembly, or group of control rods, is dropped into the core, neutrons are absorbed and the chain reaction stops. When the assembly is removed, the neutron density is large enough to sustain a chain reaction and heat is produced.

CONVECTION: The movement of heat through a liquid or gas in currents of the substance. The transfer of energy by moving masses of matter, such as the circulation of a liquid or gas.

COOLANT: A substance used to remove or transfer heat. In a nuclear reactor, the coolant also moderates, or slows down, neutrons to increase their ability to cause fission. Common coolants include water, heavy water, air, carbon dioxide, liquid sodium, and sodium-potassium alloy.

COOLING, ONCE-THROUGH: Cooling of an electric generating facility by pumping water from a river or stream through the condensers and then directly back into the river.

COOLING TOWER, DRY: A device or structure used to cool power plant condenser water by conduction and convection into the air. Intended to prevent thermal pollution of lake, river, or ocean to which water is returned.

COOLING TOWER, WET: A unit or structure, usually built of wood, used for the cooling of water by evaporation.

COOLING WATER CONSUMPTION: The cooling water withdrawn from the source supplying a generating plant which is lost to the atmosphere. Caused primarily by evaporative cooling of the heated water coming from the condenser. The amount of consumption (loss) is dependent on the type of cooling employed – direct (once through) cooling pond, or cooling tower. When not returned to the source of supply, blowdown is also included as a consumptive loss.

COOLING WATER LOAD: Waste heat energy dissipated in the cooling water.

COOLING WATER REQUIREMENT: The amount of water needed to pass through the condensing unit, dependent on the type of cooling employed and water temperature.

COOPERATIVES (COOPERATIVELY OWNED ELECTRIC UTILITIES): A group of persons who have organized a joint venture, owned by its members, for the purpose of supplying electric energy to a specified area. Such ventures are generally exempt from the Federal income tax laws. Most cooperatives have been financed by the Rural Electrification Administration.

CORD: A measure applied to a quantity of wood. One cord is a stack 4 feet by 4 feet by 8 feet. Burning one cord of wood produces approximately 5 million calories of energy.

CORE: The center of a nuclear reactor where fuel assemblies are located.

COSMIC RAYS: Radiation of many sorts but mostly atomic nuclei (protons) with very high energies, originating outside the earth's atmosphere. Cosmic radiation is part of the natural background radiation. Some cosmic rays are more energetic than any man-made forms of radiation.

COULOMB: A unit of electrical charge. It is equal to the charge of 6.25×10^{18} electrons.

CRACKING: A refining process in which large molecules of crude oil are broken down into smaller molecules by the use of heat and pressure, with or without a catalyst. This results in increased yields of gasoline of higher quality than can be produced by ordinary distillation process.

CRITICALITY: The point at which a nuclear reactor is capable of sustaining a chain reaction.

CRITICAL MASS: The smallest amount of fissionable material necessary to support a self-sustaining chain reaction.

CRUDE OIL: Petroleum liquids as they come from the ground; formed from animal and vegetable material which collected at the bottom of ancient seas.

CRYOGENICS: The science that deals with the production of very low temperatures and their effect on the properties of matter.

CUBIC FOOT (cu.ft.): The volume of a cube, the edges of which are one foot in length. The most common unit of gas volume. The amount of gas required to fill a volume of one cubic foot under standard conditions of temperature, pressure and water vapor.

CURIE: A measure of radioactivity. Any quantity of radioactive material in which 37 billion atoms are disintegrating every second is said to have an activity of one curie.

CURTAILMENT: Cutting back the use of energy resources as opposed to conserving or wisely using energy resources.

CYCLE: (1) A recurring series of functional changes or events; (2) One complete period of the reversal of an alternating electric current from positive to negative and back again.

CYCLONE COLLECTOR: A device used to collect large size particulates from polluted air by centrifugal force.

Write additional "C" words here:

D

DECAY: The action of bacteria and fungi that use organic matter as food and break it down into smaller molecules.

DECAY (RADIOACTIVE): The spontaneous transformation of one nuclide into a different nuclide or into a different energy state of the same nuclide. The process results in a decrease, with time, of the number of the original radioactive atoms in a sample.

DECAY HEAT: The heat produced by radioactive atoms in a reactor after the reactor has been shut down.

DECIBEL (dB): A unit used for measuring the intensity of sounds.

DECOMPOSERS: Organisms in an ecosystem that convert dead organic material into plant nutrients.

DECOMPOSITION: Reduction of the net energy level, structure, and change in chemical composition of organic matter because of the actions of aerobic or anaerobic microorganisms. The physical bodies and/or wastes of animals, plants, and humans are capable of decomposition.

DEGREE DAY, COOLING: A measure of the demand for space cooling in terms of an average temperature and the length of time over which it has been averaged. Generally, the number of degrees above 65°F provided by averaging a day's high and low temperatures.

DEGREE DAY, HEATING: A measure of the demand for space heating in terms of an average temperature and the length of time over which it has been averaged. Generally, the number of degrees below 65°F provided by averaging a day's high and low temperatures. The larger the degree day number, the colder the weather.

DEMAND, ELECTRIC: The requirement for electric power to be delivered by a system at a given instant, or averaged over any designated period of time, expressed in kilowatts or other suitable units.

DEMAND, AVERAGE: The demand on a system or any of its parts over an interval of time, determined by dividing the total energy supplied by the number of units of time in the interval.

DENSITY: Any quantity such as mass, number of neutrons, energy, etc. per unit volume.

DEPARTMENT OF ENERGY (DOE): The office of the U.S. Government charged with implementing energy policy as determined by Congress and the President.

DEPLETION ALLOWANCE: A tax allowance extended to the owner of exhaustible resources based on an estimate of the permanent reduction in value caused by the removal of the resource.

DESALINIZATION: Salt removal from sea or brackish water.

DEUTERIUM: A form of hydrogen atom in which the nucleus contains one proton and one neutron. About .015% of all hydrogen atoms have such nuclei. Deuterium is expected to be the primary fuel for fusion power plants. Also called "heavy hydrogen," it is the hydrogen in heavy water.

DIESEL OIL: Fuel used for internal combustion in diesel engines and space heating; usually the fraction which distills after kerosene.

DIGESTER: A container which holds organic wastes in a manner which allows natural biological degradation to occur in the absence of oxygen. This produces a gas product which has energy potential.

DIRECT CURRENT (DC): An electric current that flows in only one direction through a circuit, as from a battery.

DIRECT ENERGY CONVERSION: The process of changing any form of energy into electric energy without machinery that has moving parts. For example, a battery changes chemical energy into electric energy by direct energy conversion.

DISCOUNTED PRESENT VALUE: The value of a stream of future benefits discounted back to the time of the initial cost outlay.

DISPERSANT: A chemical agent used to break up concentrations of organic material. In cleaning oil spills, dispersants are used to remove oil from that water surface.

DISSOLVED OXYGEN (DO): The oxygen dissolved in water or sewage. Adequately dissolved oxygen is necessary for the life of fish and other aquatic organisms and for the prevention of offensive odors. Low dissolved oxygen concentrations generally are due to discharge of excessive organic solids having biological oxygen demand, the result of inadequate waste treatment.

DISSOLVED SOLIDS: The total amount of dissolved material, organic and inorganic, contained in water or wastes. Excessive dissolved solids make water unpalatable for drinking and unsuitable for industrial uses, including cooling towers.

DISTILLATE OILS: Any fuel oil, gas oil, topped crude oil or other petroleum which has a boiling range at atmospheric pressure from 550 to 1,200°F and is produced by boiling it off and condensing it during the refining process. Distillate oils account for 25-30 percent of refined petroleum products.

DISTILLATION: The separation of different substances in a solution by boiling off those of low boiling point first. For example, steam condensed back into liquid is almost pure water; impurities remain in the concentrated residue.

DISTILLATION, FRACTIONAL: A process by which crude oil is separated into various products; the fundamental process of refining. Because the various hydrocarbon compounds have different boiling points (from 250°F to below zero), they can be separated.

DISTRIBUTION: The act or process of distributing electric energy from convenient points on the transmission or bulk power system to the consumers.

DOSE: The amount of radiation delivered to a particular area or to a given part of the body.

DOSIMETER (DOSEMETER): An instrument used to measure the dose of radiation received.

DOUBLE GLAZED WINDOW: Two panes of glass factory-sealed together with a small air space between them.

DOUBLING TIME: The time it takes for a quantity to double. In the long-term (multi-cycle) operation of a breeder reactor system, the time required to achieve a net doubling of the inventory of fissionable material present in the system, expressed in years.

DRAWDOWN: The distance that the water surface of a reservoir is lowered from a given elevation as the result of the withdrawal of water. Drawdown may refer to the maximum drawdown for power operation, from normal full pool to minimum power pool. Sometimes drawdown is also expressed in terms of acre-feet of storage withdrawn.

DRAGLINE: An excavating machine used to remove the overburden in open pit mines.

DRY HOLE: A drilled well which does not yield gas and/or oil in quantities or condition to support commercial production.

DRY LIMESTONE PROCESS: A method of controlling air polution caused by sulfur oxides. The polluted gases are exposed to limestone which combines with oxides of sulfur to form manageable residues.

DUMP: A land site where solid waste is disposed; or energy generated by water power that cannot be stored or conserved when such energy is beyond the immediate needs of the producing system.

Write additional "D" words here:

E

EARTH CRUST: The relatively solid, cool exterior of the earth.

EARTH SHELTERED: One or more sides of a structure either covered or bermed with earth. Usually applied to housing.

ECOs: Energy conserving opportunities (measures).

ECOLOGICAL IMPACT: The total effect of an environmental change, either natural or human-made, on the ecology of the area.

ECOLOGICAL PYRAMIDS: Diagrams or graphs illustrating the flow of energy through a food chain in which each level of the pyramid represents a trophic level. Pyramids may represent energy, biomass, or numbers.

ECOLOGY: The interrelationships of living things to one another and to their environment or the study of such interrelationships.

ECONOMICS: A social science concerned chiefly with the description and analysis of the production, distribution, and consumption of goods and services.

ECOSPHERE: See BIOSPHERE.

ECOSYSTEM: The interacting system of a biological community and its nonliving environment.

EFFICIENCY, POWER PLANT: That percentage of the total energy content of a power plant's fuel which is converted into electric energy. The remaining energy is lost to the environment as heat. Always less than 100% of original energy available.

EFFICIENCY, THERMAL: Relating to heat, a percentage indicating the available BTU input that is converted to useful purposes. It is applied, generally, to combustion equipment.

EFFLUENT: A discharge, as in the outflow of sewage, etc.

ELASTICITY: The relative response of one variable to a small percentage change in another variable.

ELECTRIC CURRENT: A flow of electrically charged particles along a conductor.

ELECTRIC ENERGY: The energy associated with electric charges and their movements. Measured in watt hours or kilowatt hours. One watt hour equals 3600 joules or 860 calories.

ELECTRIC FIELD: The region in which a force acts on an electric charge brought into the region.

ELECTRICITY, CURRENT: The flow of charged particles (electrons) through a conductor.

ELECTRICITY, STATIC: Free charged particles (electrons) not in motion.

ELECTROCHEMICAL CELL: A cell in which chemical energy is converted to electric energy by a spontaneous oxidation-reduction reaction.

ELECTRODE: A conducting element in an electric cell, electronic tube, or semiconductor device.

ELECTRODIALYSIS: A process that uses electrical current and an arrangement of permeable membranes to separate soluble minerals from water. Often used to desalinize salt or brackish water.

ELECTROLYTE: A liquid, usually a solution, capable of conducting an electric current.

ELECTRON: A subatomic particle with a negative electrical charge, a small diameter and a mass 1/1837 that of a proton. Every atom consists of one nucleus and one or more electrons.

ELECTRON VOLT (eV): A unit of energy equal to the kinetic energy gained by an electron as it moves through a potential difference of 1 volt.

ELECTROMAGNET: A soft iron core surrounded by a coil of wire, that temporarily becomes a magnet when an electric current flows through the wire.

ELECTROMAGNETIC: Having to do with magnetism produced by an electric current.

ELECTRO-PROCESS INDUSTRY: An industry which requires very large amounts of electric energy in manufacturing for heat or chemical processes (as distinguished from wheel turning or mechanical application). Examples include electric furnace steel, aluminum, chlorine, and plating.

ELECTROSTATIC PRECIPITATOR: An air pollution control device that removes particulate matter by imparting an electrical charge to particles in a gas stream for mechanical collection on an electrode of an opposing electrical charge. Used by coal-burning power plants to remove fly ash from the combustion gases.

ELEMENT: Any substance that cannot be separated into different substances by ordinary chemical methods. All matter is composed of such substances. Elements can be transformed into other elements by radioactive decay or by nuclear reactions.

EMBARGO: A government order prohibiting entry or departure of commercial ships at its ports.

EMERGENCY CORE COOLING SYSTEM (ECCS): A series of backup safety systems designed to dump thousands of gallons of cooling water into a nuclear reactor, thus preventing a core meltdown in the event the normal core cooling system fails.

EMISSION: See EFFLUENT. (Generally used in regard to discharges into air.)

EMISSION CONTROLS: Anti-pollution controls applied to exhaust systems to reduce the discharge of both hydro-carbons and carbon monoxide. See CATALYTIC CONVERTER.

EMISSION FACTOR: The average amount of a pollutant emitted from each type of polluting source in relation to a specific amount of material processed. For example, an emission factor for a blast furnace (used to make iron) would be a number of pounds of particulates per ton of raw materials.

EMISSION INVENTORY: A list of air pollutants emitted into a community's atmosphere, in amounts (usually tons) per day, by type of source. The emission inventory is basic to the establishment of emission standards.

EMISSION STANDARD: The maximum amount of a pollutant legally permitted to be discharged from a single source.

ENDOTHERMIC REACTION: A reaction which consumes energy.

ENERGY: In scientific terms, the ability or capacity of doing work. Various forms of energy include kinetic, potential, thermal, nuclear, rotational, and electromagnetic. One form of energy may be changed to another, as when coal is burned to produce steam to drive a turbine which produces electric energy. [Also see cover.]

ENERGY AUDIT: Examination of a building, original drawing, energy history and usage patterns to identify energy conserving opportunities. Mini-audits and maxi-audits indicate the relative thoroughness of the study.

ENERGY CONSERVATION: The practice of extending the useful life of the earth's energy resources through wise and efficient management.

ENERGY CONTENT CURVE: A seasonal guide to the use of reservoir storage for at-site and downstream power generation. It is based on the following constraints: (1) During drawdown sufficient storage shall remain in the reservoir to insure meeting its share of the system firm energy requirements in the event of critical period water conditions. (2) Draft of storage for secondary energy production is permitted only to the extent that it will not jeopardize reservoir refill by the end of the coming July. Drafting below the assured refill level is permitted only if required to meet firm energy loads or if such draft is secured by a commitment to return energy equivalent to the drafted water if refill is not otherwise accomplished.

ENERGY COST SAVINGS: Energy savings x $/energy unit (therm, mcf, kwh). Note: This is not a "saving" in the purest sense. It is cost avoidance based on anticipated reduction in energy consumption.

ENERGY DENSITY: Energy per unit of mass contained in a fuel or other storage (such as batteries).

ENERGY EFFICIENCY RATIO (EER): Describes the heat removal effectiveness of refrigerators and air conditioners.

ENERGY INTENSIVE: Refers to the relative amount of energy required to accomplish some task. Certain kinds of industries are more energy intensive than others.

ENERGY MIX: The applied variable combinations of all energy sources in a locale or region, (e.g.: electrical energy might be supplied by a mix of hydroelectric, nuclear and fossil fuels).

ENERGY SHORTAGE: The situation which occurs when the supply of fuel is not great enough to satisfy the demand for energy.

ENRICHMENT: The addition of one or more substances which make the original entity richer or of greater value or effectiveness.

ENRICHMENT, URANIUM: Increasing the amount of the fissionable isotope ^{235}U above the 0.7 percent contained in natural uranium. The resulting fuel is more able to sustain a chain reaction and is normally used as the fuel for a nuclear power plant.

ENTROPY: A measure (thermodynamic) of disorder or unavailability of energy. A highly ordered system has a small value of entropy; a highly disordered system has a large value of entropy. Any use or conversion of energy irreversibly degrades its entropy, resulting in less energy available of the same quality.

ENVELOPE: Or building envelope, is the exterior structure and excludes interior walls or mechanical considerations.

ENVIRONMENT: The sum of all external conditions and influences affecting the life, development and, ultimately, the survival of an organism. Everything that affects a living organism.

ENVIRONMENTAL IMPACT: A positive or negative effect on an environment (natural or human-caused.)

ENVIRONMENTAL IMPACT STATEMENT: A document, often required by law, describing the impact an action, such as building a road, may have on the quality of the human environment. Environmental impact statements are used as tools for decision-making.

ENVIRONMENTAL PROTECTION AGENCY (EPA): The Federal agency created in 1970 to provide coordinated governmental action for the protection of the environment.

EQUILIBRIUM: The state of a system in which no further net change is occurring.

EROSION: The wearing away of the land surface by wind or water. Erosion occurs naturally from weather or runoff but is often intensified by human land-clearing practices.

ESTUARIES: Areas where the fresh water meets salt water. For example, bays, mouths of rivers, salt marshes and lagoons. Estuaries are delicate ecosystems; they serve as nurseries, spawning and feeding grounds for a large group of marine life and provide shelter and food for birds and wildlife.

ETHANOL (C_2H_3OH): A colorless liquid that burns to produce water and carbon dioxide. The vapor forms an explosive mixture with air and may be used as a fuel in internal combustion engines. It is most easily produced by the fermentation of carbohydrates.

EUTECTIC SALT: A substance used to store solar heat.

EVAPORATION: The gradual change from liquid to gas (or vapor) in which molecules escape from the surface of the liquid. It is usually distinguished from boiling, where the change from liquid to gas occurs at a temperature where the vapor pressure equals the external pressure and bubbles form.

EXCLUSION AREA: An area of ½ mile immediately surrounding a nuclear reactor where human habitation is prohibited to assure safety in the event of an accident.

EXOTHERMIC (EXERGONIC) REACTION: A reaction which releases more energy than is required to start it. Combustion (burning), fission and fusion are examples of such a reaction.

EXPONENTIAL GROWTH: A quantity exhibits exponential growth when it is increased by a constant percentage of the whole during a constant time period. A colony of bacteria in which each bacterium divides into 2 bacteria every 10 minutes grows exponentially.

EXTERNALITY: The discrepancies which exist between private and social benefits and costs.

Write additional "E" words here:

F

FABRIC FILTER: A device for removing dust and particulate matter from industrial emissions much like a home vacuum cleaner bag. The most common use of fabric filters is baghouse.

FAHRENHEIT: The temperature scale on which the freezing point of water is 32 degrees and the boiling point of water is 212 degrees.

FAHRENHEIT DEGREE: 1/180 of the difference between the temperature of melting ice and that of water boiling under standard atmospheric pressure.

FAST BREEDER REACTOR: A fission reactor in which the neutrons are traveling at high velocities, producing more fissionable material than is consumed. The principal nuclear reaction envisioned for most proposed fast breeders is conversion of nonfissionable uranium 238 to fissionable plutonium 239.

FEEDSTOCK: Energy resources used as raw materials in the production of such products as wax and asphalt rather than as fuels for burning.

FENESTRATION: Arrangement or proportion of windows in a building.

FERMENTATION: A process in which carbohydrates are changed to hydrocarbons by the action of microorganisms.

FERTILE NUCLEUS (FERTILE MATERIALS): Material, not itself fissionable by thermal neutrons, which can be converted into a fissionable material by irradiation in a reactor. When the two basic fertile materials, uranium 238 and thorium 232, capture neutrons, it results in nuclei which are unstable and decay in two steps to fissionable plutonium 239 and uranium 235 respectively.

FILLING: The process of depositing dirt and mud in marshy areas to create more land for real estate development. Filling can disturb natural ecological cycles.

FILM BADGE: A piece of masked photographic film worn as a badge by nuclear workers to monitor exposure to radiation. Nuclear radiation darkens the film.

FILTRATION: In waste water treatment, the mechanical process that removes particulate matter by separating water from solid material, ususally by passing it through sand.

FIRM ENERGY: Electric energy which is considered to have assured availability to the customer to meet all or any agreed upon portion of the customer's requirements.

FIRM LOAD: That part of the system load which must be met with firm electric energy.

FIRST COST: Original construction cost; does not consider recurring management and operations cost.

FIRST LAW OF THERMODYNAMICS: Also called the Law of Conservation of Energy: Energy can be neither created nor destroyed.

FISSION: The splitting of a heavy atom into two parts, releasing large amounts of energy and one or more neutrons.

FISSILE: Fissionable; capable of being split.

FISSIONABLE: Capable of being split.

FISSIONABLE MATERIAL: Any material fissionable by slow neutrons. The basic materials are uranium 235 and plutonium 239.

FISSION PRODUCTS: The nuclei formed by the fission of heavy elements, plus nuclides formed by the fission fragments' radioactive decay. Fission products are radioactive.

FLARE GAS: Unutilized natural gas burned in flares at an oil field; waste gas.

FLAT PLATE COLLECTOR: A device designed to capture the sun's energy and produce low temperature heat energy. Commonly used as the collectors for solar heating systems.

FLUE GAS: A mixture of gases resulting from combustion and emerging from a chimney. Flue gas includes nitrogen oxides, carbon oxides, water vapor and often sulfur oxides or particulates.

FLUIDIZED BED: A fluidized bed results when a fluid (usually a gas) flows upward through a bed of suitably sized solid particles at a velocity high enough to buoy the particles, to overcome the influence of gravity, and to impart to them an appearance of great turbulence. Fluidized beds are used in the petroleum industry.

FLY ASH: Fine solid particles of noncombustible ash carried out of a chimney with waste gases.

FLYWHEEL STORAGE: A method of storing kinetic energy in the rotational movement of a large wheel. Flywheels are being tested for energy storage in large vehicles as well as for use in the electric utility industry.

FOAM INSULATION: (1) styrofoam, (2) rigid foam boards, or (3) liquid foam insulation.

FOOD CHAIN (FOOD WEB): A sequence of organisms, including producers, herbivores, and carnivores, through which energy and materials move within an ecosystem.

FOOD WASTE: Animal and vegetable waste resulting from the handling, storage, sale, preparation, cooking and serving of foods; commonly called garbage.

FOOT CANDLE: A unit for measuring illumination; equal to the amount of light received from a standard candle from a distance of 1 foot.

FORBAY: The water behind a dam.

FORCE: That which changes the state of rest or motion of matter, measured by the rate of change in momentum. The force F required to produce an acceleration a of a mass m is expressed as $F=ma$.

FOSSIL FUELS: Coal, oil, natural gas, and other fuels originating from geologic deposits of ancient plant and animal life and depending on oxidation for release of energy.

FRACTIONAL DISTILLATION: A process by which crude oil is separated into various products; the fundamental process of refining.

FRACTIONS (CUTS): A refiner's term for the portions of oils containing a number of hydrocarbon compounds within certain boiling ranges, separated from other portions in fractional distillation. They are distinguished from pure compounds which have specified boiling temperatures, not a range.

FREE ENERGY: That part of the total energy of a system that can do work under conditions of constant temperature and pressure.

FREEZING POINT: The temperature at which a liquid changes into a solid.

FRICTIONAL FORCE: Resistance to the motion of one surface against another.

FUEL ASSEMBLY: A grouping of fuel elements into a bundle.

FUEL: A substance whose chemical or nuclear energy can be released by combustion or nuclear reaction.

FUEL CELL: A device in which fuel and oxygen are combined to produce chemical energy that is converted directly into electrical energy.

FUEL CYCLE: The series of steps involved in supplying fuel for nuclear power reactors. It includes mining, refining, the original fabrication of fuel elements, their use in a reactor, chemical processing to recover the fissionable material remaining in the spent fuel, re-enrichment of the fuel material, and refabrication into new fuel elements.

FUEL ELEMENT: A rod, tube, plate or other mechanical shape or form into which nuclear fuel is fabricated for use in a reactor.

FUEL MIX: The percentage of various fuels that make up the total fuel consumption.

FUEL REPLACEMENT ENERGY: Electric energy generated at a hydroelectric plant as a substitute for energy which would otherwise have been generated by a thermal-electric plant.

FUEL REPROCESSING: The chemical or metallurgical treatment of used fuel from a nuclear reactor for the purpose of recovering and decontaminating fissionable materials.

FUEL ROD: A cylindrical rod, 12 to 14 feet long, made up of pellets containing nuclear fuel.

FUSE: A safety device which melts when too large an electric current is flowing, thus breaking the circuit and shutting off the current when there is danger of fire.

FUSION, NUCLEAR: A nuclear reaction involving the combination of smaller atomic nuclei into larger ones with the release of energy. This is also called a thermonuclear reaction because of the extremely high temperature required to initiate it.

FUSION, LASER INDUCED: A process in which the high temperature required to initiate fusion is produced by bombarding small pellets of deuterium and tritium with multiple intense bursts of radiation from one or more lasers.

Write additional "F" words here:

G

GALLON: A unit of volume. A U.S. gallon contains 231 cu.in., 0.133 cubic feet, or 3.785 liters. One U.S. gallon of water weighs 8.3 lbs.

GALVANOMETER: An instrument to detect small direct electric currents.

GAMMA RAYS: Electromagnetic waves of radiant energy emitted by the nucleus of a radioactive substance. Of the three types of nuclear radiation, gamma rays have the greatest penetrating capability and are best stopped by dense materials such as lead. Somewhat similar to x-rays, but shorter in wavelength.

GARBAGE: See FOOD WASTE.

GARBAGE DUMP: An area of land where refuse from a community is discarded.

GAS: The phase of matter which occupies any available volume. A condition in which the molecules are practically unrestricted by cohesive forces. A gas has neither definite shape nor volume.

GAS-COOLED REACTOR (GCR): A type of nuclear power reactor in which gas, usually helium, flows through the reactor core, becomes heated, and then gives up its heat to produce steam in a separate vessel. The steam is then used to drive a turbine.

GAS, HI-BTU: Synthetically produced gas, predominately methane, which has an energy content equivalent to that of natural gas (950 to 1,000 BTUs per cubic foot).

GASIFICATION: A process still in the experimental stages in which coal is burned in the mine to produce gas which is then piped to the surface. The gas can then be used as a source of heat to produce electric power, or can be broken down into liquid fuels such as gasoline.

GAS, ILLUMINATING: A gas containing relatively large amounts of unsaturated and/or heavy hydrocarbon gases, which burn with a luminous flame.

GAS, MANUFACTURED: A gas obtained by the destructive distillation of coal, by the thermal decomposition of oil, or by the reaction of steam passing through a bed of heated coal or coke. The amount of heat released in combustion varies widely.

GAS, NATURAL: Mixtures of hydrocarbon gases and vapors occurring naturally in certain geologic formations, with or without accompanying crude oil. The amount of energy available in combustion is higher than for manufactured gas.

GASOLINE: A liquid mixture of light hydrocarbons produced by refining ("cracking") crude oil. Used chiefly as a fuel in internal-combustion engines.

GASOHOL: A mixture of 90% gasoline and 10% alcohol, which can be used as a replacement for straight gasoline in cars. Presently more expensive than gasoline.

GAS TURBINE: An engine driven by high speed combustion gases striking rotating blades.

GAS, WOOD: A gaseous fuel which can be produced from wood.

GEIGER COUNTER: An electrical device used to measure the intensity of gamma or beta radiation from radioactive materials.

GENERATING CAPACITY: The capacity of a power plant to generate electricity. Usually measured in megawatts (MW).

GENERATING STATION (GENERATING PLANT): A station at which are located prime movers, electric generators and auxiliary equipment for converting mechanical, chemical, and/or nuclear energy into electrical energy.

GENERATION: The act or process of producing electric energy from other forms of energy; also the amount of electric energy so produced.

GENERATOR: A device that converts mechanical energy into electrical energy, using the energy from falling water or steam to spin a turbine that turns a coil of wire in the presence of a magnetic field, producing an electric current.

GEOTHERMAL ENERGY: The heat energy available in the earth's subsurface, extracted from three basic sources: (1) steam; (2) hot water; and (3) hot rocks or near-surface intrusions of volcanic molten rock. The thermal gradient of the earth's crust is such that the temperature in a deep well or mine increases by about $1^{o}F$ for each 100 feet of depth.

GEOPRESSURED RESERVOIR: Geothermal reservoir consisting of porous sands containing water or brine at high temperature or pressure.

GIGAWATT (GW): 1,000,000,000 watts; 1,000,000 kilowatts; 1,000 megawatts.

GLAZING: Another term for glass used in windows.

GRAVITATION: The universal attraction existing between all material bodies.

GREEN BELTS: Certain areas restricted from being used for roads, buildings, and houses; they often serve as separating buffers between pollution sources and concentrations of population.

GREENHOUSE EFFECT: The heat effect of the atmosphere upon the earth. Light waves from the sun pass through the air and are absorbed by the earth. The earth then reradiates this energy as heat waves that are absorbed by the air, specifically by carbon dioxide. The air thus behaves like glass in a greenhouse, allowing the passage of light but not of heat. Thus, many scientists theorize that an increase in the atmospheric concentration of CO_2 can eventually cause an increase in the earth's surface temperature. A method of using solar radiation to warm underheated areas.

GRAPHITE (REACTOR GRADE): A very pure form of carbon used as a moderator in nuclear reactors.

GROSS NATIONAL PRODUCT (GNP): The total market value of the goods and services produced by the nation before the deduction of depreciation charges and other allowances for capital consumption; a widely used measure of economic activity.

GROUND COVER: Grasses or other plants grown to keep soil from being blown or washed away.

GROUNDWATER: The supply of water under the earth's surface in an aquifer or soil that forms a natural reservoir.

Write additional "G" words here:

H

HABITAT: The sum total of environmental conditions of a specific place that is occupied by an organism, a population or a community.

HALF-LIFE: The time required for certain materials, such as persistent pesticides or radioactive isotopes, to lose half their strength. Measured half-lives vary from millionths of a second to billions of years. For example, the half-life of DDT is 15 years; the half-life of radium is 1,580 years.

HAMMERMILL: A broad category of highspeed equipment that uses pivoted or fixed hammers or cutters to crush, grind, chip or shred solid wastes.

HEAT: Molecular kinetic energy transferred from one object to another or obtained by conversion from another form of energy (as in conversion from electrical or chemical energy). Usually measured in calories; in space heating by the British Thermal Unit.

HEAT CAPACITY: The quantity of heat required to increase the temperature of a system or substance one degree of temperature. It is usually expressed in calories per degree Celsius.

HEAT ENERGY: Energy that causes an increase in the temperature of an object or changes the object from solid to liquid or from liquid to gas.

HEAT ENGINE: Any device that converts heat energy into mechanical energy.

HEAT EXCHANGER: Any device that transfers heat from one fluid (liquid or gas) to another or to the environment.

HEAT GAIN: The amount of heat, expressed in BTUs, that enters an enclosed living space from outside the space or is produced by people and devices (such as a kitchen range) within the living space.

HEAT ISLAND EFFECT: An air circulation problem peculiar to cities. Tall buildings, heat from pavements and concentrations of pollutants create a haze dome that prevents rising hot air from being cooled at its normal rate. A self-contained circulation system is put in motion that can be broken by relatively stong winds. If such winds are absent, the heat island can trap high concentrations of pollutants and present a serious health problem.

HEAT LOSS: The amount of heat, expressed in BTUs, that escapes from an enclosed heated living space.

HEAT PUMP: A device that transfers heat from a cooler region to a warmer one by the expenditure of mechanical or electrical energy. In residential heating-cooling systems, a device that absorbs heat from the outside air and pumps it into the house, and inversely operates as an air conditioner for cooling.

HEAT RATE: A measure of a thermal generating station's efficiency, generally expressed at BTU per (net) kilowatt-hour. It is computed by dividing the total BTU available from the fuel burned (or of heat released from the nuclear reactor) by the resulting net kilowatt-hours generated.

HEAT SINK: Anything that absorbs heat; usually part of the environment, such as the air, a river, or outer space.

HEATING SEASON: The coldest months of the year.

HEAVY WATER: Water composed of isotopes of hydrogen of atomic weight greater than 1 or of oxygen greater than 16, or both. Especially water composed of ordinary oxygen and the isotope of hydrogen of atomic weight 2; deuterium oxide (D_2O).

HEAVY WATER MODERATED REACTOR: A reactor that uses heavy water as its moderator. Heavy water is an exceilent moderator and thus permits the use of inexpensive (unenriched) uranium as a fuel

HERBIVORE: An organism that eats plants to obtain food energy.

HETEROTROPH: An organism that must feed on complex food materials that have originated in other organisms.

HIGH SULFUR COAL: Generally, coal that contains more than one percent of sulfur by weight.

HIGH TEMPERATURE GAS COOLED REACTOR (HTGCR): A nuclear reactor cooled with helium.

HIGH TENSION: High voltage.

HI-VOLUME SAMPLER: A device used in the measurement and analysis of suspended particulate pollution. Also called a Hi-Vol.

HORSE POWER: British unit of power; measures the rate at which energy is produced or used. 1 Hp=746 watts, or 42.408 BTUs per minute.

HOT: A colloquial term meaning highly radioactive or being at high voltage.

HOT ROCK RESERVOIR: A potential source of geothermal power. The "hot rock" system requires drilling deep enough to reach heated rock, then fracturing it to create a reservoir into which water can be pumped. A technique which has not yet been perfected.

HUMUS: Decomposed organic material in the soil.

HVAC (or hvac): Heating, ventilating, and air conditioning systems.

HYDRAULIC RAM: A device which uses the energy of falling water to force a small portion of the water to a height greater than the source.

HYDRO-: Prefix denoting water or hydrogen.

HYDROCARBONS: A vast family of compounds containing carbon and hydrogen in various combinations, found especially in fossil fuels. Some hydrocarbons are major air pollutants, some may be carcinogenic and others contribute to photochemical smog.

HYDROELECTRICITY: Electric energy production by water-powered turbine generator.

HYDROELECTRIC PLANT, CONVENTIONAL: A hydroelectric power plant which utilizes stream flow only once as the water passes downstream, as opposed to a pumped-storage plant which recirculates all or a portion of the streamflow in the production of power.

HYDROELECTRIC PLANT, PUMPED-STORAGE: A hydroelectric power plant which recirculates all or a portion of the streamflow in the production of power.

HYDROGEN RECOMBINER: A device which combines hydrogen with oxygen, producing water; used to separate hydrogen from other gases.

HYDROGEN SULFIDE (H_2S): A malodorous gas made up of hydrogen and sulfur with the characteristic odor of rotten eggs. It is emitted in the natural decomposition of organic matter. H_2S is also a byproduct of refinery activity and the combustion of oil during power plant operations. In heavy concentrations, it can cause illness.

HYDROGENATION: The addition of hydrogen to an organic molecule to increase the ratio of hydrogen to carbon. A process for the production of oil from coal or organic waste.

HYDROLOGY: The science dealing with the properties, distribution and circulation of water and snow.

HYDROPOWER: Power produced by falling water.

HYDROTHERMAL RESERVOIR: One of three forms of geothermal reservoir systems. Consists of naturally circulating hot water or steam ("wet steam") or those which contain mostly vapor ("dry steam"). The later type of reservoir is the most desirable type with present technology.

Write additional "H" words here:

ILLUMINATION OF A SURFACE: The amount of light falling per second on unit area of the surface. Measured in lumens per unit area.

ION: An atom or molecule which has become electrically charged through the loss or gain of one or more electrons during a chemical reaction or by the action of radiant energy, etc. The loss of electrons results in a positively charged ion; the gain of electrons results in a negatively charged ion.

IONIZING RADIATION: Radiation capable of driving electrons out of atoms and thus disrupting the structure and function of molecules.

IMPLEMENTATION PLAN: A document of the steps to be taken to ensure attainment of environmental quality standards within a specified time period. Implementation plans are required by various laws.

IMPORT QUOTA: Government-set limit on the amount of a foreign product which may be imported into this country.

IMPORTS, ENERGY: Energy forms imported from outside the region.

IMPOUNDMENT: A body of water, such as a pond, confined by a dam, dike, floodgate or other barrier.

INCINERATOR: A furnace for burning garbage and other refuse; or an apparatus used to burn waste substances in which all the combustion factors (temperature, retention time, turbulence, and combustion air) can be controlled.

INDUSTRIAL REVOLUTION: The beginning of the system of mass producing most manufactured objects in large factories and distributing and selling them with the help of greatly improved transportation.

INERTIA: A property of matter by which it remains at rest or in uniform motion in the same straight line unless acted upon by some external force.

INFILTRATION: The flow of a fluid into a substance through pores or small openings. Commonly used in hydrology to denote the flow of water into soil material. Also used to refer to the movement of air from a colder to a warmer portion of the environment.

INFRARED: A kind of invisible radiation that has a wavelength a little longer than that of visible light. Has a penetrating heating effect.

INJECTION: (1) a fuel under pressure forced into a combustion chamber. (2) Forcing gas or water into an oil well in order to increase pressure within the well to force oil to the surface.

IN SITU: In the natural or original position or location. In situ production of shale oil, for example, is an experimental technique in which a region of shale is drilled, fractured, and set on fire. The volatile gases burn off, the oil vaporizes, then condenses and collects at the bottom of the region, from which it can be recovered by a well. There has also been experimentation with in situ conversion of coal.

INSTANTANEOUS PEAK: The maximum demand at the instant of greatest load, usually determined from the readings of indicating or graphic meters.

INSULATION: Any material that provides a high resistance to the flow of heat, sound or electricity from one surface or area to another.

INTERCHANGE: Kilowatt-hours delivered to or received by one electric utility system from another in times of emergency or shortage.

INTERMEDIATE ENERGY FORMS: Energy in transit from its primary form to the form in which it is useful. For example, the energy of falling water (the primary energy form) is converted to electric energy (the intermediate form), which in turn is converted to heat energy (the final form) in a radiator.

INTERNAL COMBUSTION ENGINE: Usually refers to an engine in which power is generated within one or more cylinders by the burning of a mixture of air and fuel, and converted into mechanical work by means of a piston.

INTERRUPTIBLE LOAD: Power made available under agreements which permit curtailment or cessation of delivery by the supplier.

INTERSTATE WATERS: According to law, waters defined as (1) river, lakes and other waters that flow across or form a part of state or international boundaries; (2) waters of the Great Lakes; (3) coastal waters whose scope has been defined to include ocean waters seaward to the territorial limits and waters along the coastline (including inland streams) influenced by the tide.

INTERTIE: An interconnection permitting passage of current between two or more electric utility systems.

INVERSION: An atmospheric condition where a layer of cool air is trapped by a layer of warm air so that it cannot rise. Inversions spread polluted air horizontally rather than vertically so that contaminating substances cannot be widely dispersed. An inversion of several days can cause an air pollution episode.

ISOTOPE: Any of two or more species of atoms with the same atomic number (the same number of protons in the nucleus), but with different atomic masses because of differing numbers of neutrons in the nucleus. All isotopes of an element have the same number of orbital electrons, and thus very similar chemical properties, but the differing atomic masses produce slightly different physical properties. Since the atomic mass governs the stability of the nucleus, one or more isotopes of an element may be radioactive or fissionable while other isotopes of the same element are stable.

Write additional "I" words here:

J

JOULE: A metric unit of work or energy; the energy produced by a force of one newton operating through a distance of one meter. Equivalent to one watt second.

Write additional "J" words here:

K

KEROGEN: A resinous hydrocarbon material that is the chief organic constituent of oil shale. When heated to 450 to 600°C., kerogen releases vapors that can be converted to raw shale oil, a black, viscous mixture of hydrocarbons. Shale oil can, in turn, be converted into petroleum products by refining.

KEROSENE: The petroleum fraction containing hydrocarbons that are slightly heavier than those found in gasoline. Its boiling point range is 180 to 300°C. Kerosene is used as a fuel for gas turbines or jet engines.

KILO: A prefix indicating 1000; thus a kilovolt (kV) equals 1000 volts and a kilowatt (kW) equals 1000 watts.

KILOCALORIE (kcal): Heat energy equal to 4.19 x 10^8 joules. The unit generally used in making metabolic measurements.

KILOVOLT (kV): 1,000 volts.

KILOWATT (kW): A unit of power, usually used for electric power, equal to 1,000 watts, or to energy consumption at a rate of 1,000 joules per second. Roughly, a power of 1 kW is capable of raising the temperature of a pound (pint) of water 1°F in one second.

KILOWATT DEMAND: The instantaneous draw of electrical power that is taken by a facility from a utility company or its own generating facility.

KILOWATT-HOUR (kWh): The amount of work or energy delivered during the steady consumption of 1 kilowatt of power for a period of one hour. Equivalent to about 853 calories of heat energy.

KINETIC ENERGY: The energy of motion; the ability of an object to do work because of its motion. A car has kinetic energy simply because it is in motion. Kinetic energy is described and measured by the object's mass and speed.

Write additional "K" words here:

L

LEACHING: The process by which soluble materials in the soil, such as nutrients, pesticide chemicals or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water.

LEAD: A heavy metal that may be hazardous to human health if breathed or ingested.

LIFE CYCLE: The phases, changes or stages an organism passes through during its lifetime.

LIFE CYCLE COSTS: The total cost of a system (such as a school building) figured year-by-year over the entire life of a project. This includes the initial cost as well as future fuel and maintenance costs. It is normal to account for future costs by including an inflation factor.

LIFT: In a sanitary landfill, a compacted layer of solid waste and the top layer of cover material.

LIGHT: Radiant electromagnetic energy which an observer can see.

LIGHT ENERGY: The kind of energy that travels as visible radiation; photons.

LIGHT WATER REACTOR (LWR): A power plant which uses ordinary water, as distinguished from one that uses heavy water. Fission energy is released in the form of heat and is transferred to a conventional steam cycle which generates electric energy.

LIGNITE: A brownish-black coal in which the alteration of vegetal material has proceeded further than in peat, but not as far as in subbituminous coal.

LIMITING FACTOR: A factor which controls species location and population size, such as shortage of water, food, etc.

LIMNOLOGY: The study of the physical, chemical, meteorological and biological aspects of fresh waters.

LINEAR ACCELERATOR: A long straight tube (or series of tubes) in which charged particles (ordinarily electrons or protons) gain in energy by the action of oscillating electro-magnetic fields.

LIQUEFACTION OF COAL: The conversion of coal to liquid fuels; a method for making large amounts of gasoline and heating oils. See HYDROGENATION.

LIQUEFIED NATURAL GAS (LNG): Natural gas which has been changed into a liquid by cooling to approximately -160°C. Since liquefaction reduces the volume of gas to about 1/600 of its original state, the cost of shipping and storage is reduced.

LIQUID METAL REACTOR (LMR): A type of nuclear power reactor in which a liquid metal such as sodium flows through the reactor core, is heated, and delivers the heat to produce steam in a separate vessel containing water.

LITHIUM: A naturally occurring element which contains two isotopes, lithium 6 (7.5%) and lithium 7 (92.4%). Lithium 6 is a source for the production of tritium, a possible reactant for fusion reactions.

LOAD: The power and energy requirements of users on the electric power system in a designated area or the amount of power delivered to a given point.

LOAD DIVERSITY: The difference between (1) the sum of the separate peak loads of two or more load areas and (2) the actual coincident peak load of the combined areas which occurs when their annual peak loads occur in different seasons of the year. The peak load period for a northeastern section might be winter; for a southern state it might be summer when use of air conditioning is high.

LOAD FACTOR: The ratio of the average load over a designated period to the peak load occurring in that period.

LOAD SHAPE (LOAD PATTERN): The characteristic variation in the magnitude of the power load with respect to time. This can be for a daily, weekly, or annual period.

LOOSE INSULATION: Small pieces of insulation which are blown into place.

LOSS OF FLUID TEST (LOFT): A facility designed to conduct tests and study the results of simulated and small scale nuclear accidents resulting from the loss of reactor coolant.

LOSSES, ELECTRIC SYSTEM: Total electric energy losses between sources of supply and points of delivery.

LURGI PROCESS: A coal gasification process developed by the Germans and used during WWII. It is commercially used today in Europe. It produces a gas lower in heat value than natural gas.

Write additional "L" words here:

M

MAGMA: Molten rock within the earth's interior.

MAGNETIC FIELD: A region in which a magnetic force can be detected.

MAGNETIC STORAGE: A method of storing energy in the magnetic field of a superconducting magnet.

MAGNETOHYDRODYNAMIC POWER CYCLES (MHD): A method of converting coal and other fossil fuels into electric energy by burning the fuel and passing the combustion products (plasma) through a magnetic field at very high temperatures. A technique for generating electric energy directly by moving liquids or gases through a magnetic field rather than indirectly by means of turbines and rotating generators.

MANTLE: The semisolid layer of the earth that is between the crust and the core.

MARGINAL: Extra or additional. Marginal energy consumption, for example, would be the extra energy used as a result of the addition of one more person in a city.

MASS: The quantity of matter. The mass of an object may be determined by dividing the force it exerts downward on the earth (its weight) by the acceleration of gravity.

MATTER: Anything which is solid, liquid or gas, and has mass.

MAXIMUM DEMAND: The greatest of the load demands which has occurred during a specified period of time.

MAXIMUM PLANT CAPABILITY (HYDRO): The maximum load which hydroelectric plants can supply under optimum conditions without exceeding approved limits on temperature and stress.

mcf: One thousand cubic feet.

MECHANICAL ENERGY: The energy of motion used to perform work.

MEDIAN STREAM FLOW (MEDIAN HYDRO): The rate of discharge of a stream for which there are equal numbers of greater and lesser flow occurrences during a specified period.

MEDIUM: (1) Something through which a force acts or an effect is produced; i.e. copper acting as a medium for conducting heat; (2) Any surrounding substance in which bodies exist or move; i.e. any material (solid, liquid, gas or vacuum) in which waves travel; (3) A sterilized nutritive substance for cultivating bacteria, viruses, etc.

MEGA-: Prefix meaning large; one million of the specified unit.

MEGAWATT (MW): A unit of electrical power equal to 1,000 kilowatts or 1 million watts.

MEGAWATT-HOUR (MWh): One thousand kilowatt-hours.

MEGAWATT MONTH: A unit of energy equal to one megawatt of power flowing continuously for an average month of 30.4 days or 730 hours.

MELTDOWN: The most serious nuclear reactor accident possibility in which a loss of cooling would cause the reactor core to overheat and melt.

METHANE GAS (CH_4): A colorless, nonpoisonous and flammable gaseous hydrocarbon emitted by marshes and by dumps undergoing anaerobic decomposition. Can be manufactured from crude petroleum or other organic materials.

METHYL ALCOHOL (CH_3OH): A poisonous liquid whose principle source is the destructive distillation of wood. Could be utilized as a liquid fuel. (Also known as methanol or wood alcohol.)

METRIC MEASUREMENT: A decimal system of weights and measures based on the meter and on the kilogram.

mgd: Millions of gallons per day; used to express rate of water flow.

MICROWAVE: In general usage, microwaves refer to electromagnetic waves whose lengths are sufficiently short to exhibit some of the properties of light. Microwaves are usually used in point-to-point communications because they are easily concentrated into a beam. Frequencies of more than 1,000 megahertz are usually considered to be microwave frequencies.

MILL: (1) A building or group of buildings with machinery for manufacturing or processing something; (2) A monetary unit used in calculating, but not as a coin (1/1,000 of a dollar; 1/10 of a cent). The cost of electric energy is often given in mills per kilowatt-hour.

MILLIREM: A unit of radiation dosage equal to one-thousandth of a rem. An individual can receive up to 500 millirems per year according to federal standards. This limit does not include radiation recived for medical treament nor does it include the 100 to 250 millirems people receive annually from background radiation from cosmic rays or naturally-occurring radioactive materials in the soil or atmosphere.

MINE: An opening or excavation in the earth for the purpose of extracting minerals.

MOBILE HOME SKIRT: A foundation piece added to enclose the area under a mobile home.

MODERATOR: A material used in a nuclear reactor to slow the speed of neutrons and thus increase the probability of neutron capture and subsequent fission by atoms of the nuclear fuel. Common moderators are graphite, water, deuterium, and beryllium.

MOLECULE: Atoms combined to form the smallest natural unit of an element or a compound.

MONITORING: Periodic or continuous determination of the amount of pollutants or radioactive contamination present in the environment.

MOTION: Continuous change of location or position of a body.

MOTOR: A machine which converts electrical energy into mechanical energy or does work.

MULCH: A layer of wood chips, dry leaves, straw, hay or other material placed on the soil around plants to retain moisture, to prevent weeds from growing and to enrich the soil.

MUNICIPALITY: A utility company managed by a city government.

MUTATION: A permanent chromosomal change which results in an alteration of the characteristics of offspring.

Write additional "M" words here:

N

NATIONAL ENERGY PLAN: Enacted into law in 1978, the National Energy Plan rests on these principles: (1) Conservation and efficient use of fuel, (2) Realistic prices to fuel producers and realistic charges to users, (3) A continuing government policy that everyone can rely on, (4) Increased use of coal and uranium instead of the oil and natural gas that are in short supply, (5) Development of new and little used technologies for the future. This includes solar power, geothermal energy, fusion, cogeneration of electricity and steam heat, solid wastes, ocean energy, and smaller hydroelectric sites, (6) Protection of the environment, and (7) Care that the burden of conservation and higher prices will be shared equally by all parts of the country and all economic groups.

The plan includes seven specific goals to be reached by 1985: (1) Reduce the energy consumption growth rate to below 2% per year, (2) Reduce gasoline consumption by 10% below the 1976 level, (3) Reduce oil imports to less than 6 million barrels per day, (4) Establish a Strategic Petroleum Reserve – an oil storehouse – of 1 billion barrels, (5) Increase production of our most abundant fuel – coal – by two-thirds, to more than 1 billion tons a year, (6) Insulate 90% of American homes and all new buildings, (7) Use solar energy in 2.5 million homes.

NATURAL GAS: See GAS, NATURAL.

NATURAL SELECTION: The natural process by which the organisms best adapted to their environment survive and those less well adapted are eliminated.

NEUTRON: An uncharged elementary particle that has a mass nearly equal to that of the proton. Present in all known atomic nuclei except the hydrogen nucleus, neutrons are the particles that sustain a chain reaction in a nuclear reactor.

NET PRODUCTIVITY: The amount of light energy converted to chemical energy less the amount dissipated (converted to heat energy) by plants in the course of respiration.

NEWTON: The force required to change the velocity of a one-kilogram mass one meter per second in a period of one second. A newton corresponds to about 4.4 pounds of force.

NIGHT (NITE) SET BACK: Automatic controls to bring building into unoccupied status; reduces operational temperature, closes dampers.

NITRIC OXIDE (NO): A gas formed in great part from atmospheric nitrogen and oxygen when combustion takes place at high temperatures and high pressure as in internal combustion engines. NO is not itself a pollutant; however, in the ambient air, it converts to nitrogen dioxide, a major contributor to photochemical smog.

NITROGEN DIOXIDE (NO_2): A compound produced by the oxidation of nitric oxide in the atmosphere; a major contributor to photochemical smog.

NOBLE GASES: Gases which do not normally combine chemically with other materials. The noble gases are helium, neon, argon, krypton, xenon and radon.

NON-FIRM POWER: Power supplied or available under an arrangement which does not have a guarantee of continuous availability. The opposite of FIRM POWER.

NON-RENEWABLE RESOURCES: Depletable energy resources such as the fossil fuels – coal, gas and oil.

NUCLEAR ELECTRIC POWER PLANT: A facility in which heat for generation of steam is provided by fission rather than combustion of fossil fuel.

NUCLEAR ENERGY: Energy that can be produced by changes in the nucleus of an atom as by fission of a heavy nucleus or by fusion of light nuclei into heavy ones with accompanying loss of mass.

NUCLEAR (ATOMIC) FUEL: Material containing fissionable uranium of such composition and enrichment that, when placed in a nuclear reactor, will support a self-sustaining fission chain reaction and produce heat in a controlled manner for process use.

NUCLEAR POWER: Electric power produced from a power plant by converting the energy obtained from nuclear reaction.

NUCLEAR POWER PLANT: Any device, machine, or assembly that converts nuclear energy into some form of useful power, such as mechanical or electrical power. In a nuclear electic power plant, heat produced by a reactor is generally used to make steam to drive a turbine that, in turn, drives an electric generator.

NUCLEAR REACTION: A reaction involving a change in an atomic nucleus, such as fission, fusion, neuton capture, or radioactive decay; as distinct from a chemical reaction, which is limited to changes in electron structure surrounding the nucleus.

NUCLEAR REACTOR: A device in which a nuclear chain reaction can be initiated, maintained, and controlled.

NUCLEAR REGULATORY COMMISSION (NRC): An agency of the federal government which has authority to regulate, inspect and oversee all activities involved with nuclear power generation.

NUCLEUS: The dense central core of the atom in which most of the mass and all of the positive charge is concentrated.

NUCLIDE: A specific type of atom that is characterized by its nuclear properties, such as the number of neutrons and protons and the energy state of its nucleus.

NUTRIENT: Elements or compounds essential as raw material for organism growth and development; for example, carbon, oxygen, nitrogen and phosphorus. Classes of nutrients in food are carbohydrates, fats, proteins, vitamins, minerals and water.

Write additional "N" words here:

O

OCEAN THERMAL ENERGY CONVERSION (OTEC): A process of generating power by harnessing the temperature differences between surface waters and ocean depths.

OCEAN THERMAL GRADIENTS: The temperature difference between deep and surface water.

OFF-PEAK: Energy supplied during periods of relatively low system demands.

OFFSHORE DRILLING: Drilling for oil off the coast.

OHM: Unit of measure of electrical resistance. One volt will force a current of one ampere through a resistance of one ohm.

OIL: (1) Any of the various kinds of greasy, combustible substances obtained from animal, vegetable, and mineral sources. Oils are liquid at ordinary temperatures and soluble in certain organic solvents, but not in water; (2) Petroleum.

OIL, LOW SULFUR: Generally, oil that contains one percent or less of sulfur by weight.

OIL SHALE: A sedimentary rock containing solid organic matter (kerogen) that yields substantial amounts of oil when heated to high temperatures.

OIL SPILL: The accidental discharge of oil into oceans, bays, or inland waterways. Methods of oil spill control include chemical dispersion, combustion, mechanical containment, and absorption.

OPEC (ORGANIZATION OF PETROLEUM EXPORTING COUNTRIES): An organization of countries in the Middle East, North Africa, and South America which aims at developing common oil-marketing policies.

OPEN BURNING: The burning of wastes in an unconfined area.

OPEN-PIT MINING: Any mining at or near the surface, such as the obtaining of coal from the outcroppings or by the removal of overburden from a seam of coal. Also called surface mining, strip mining, placer mining, or open-cast mining.

OPPORTUNITY COST: The real social cost of using particular resources. The opportunity cost measures the value of all the things that cannot be produced as a result of a resource being used in the production of a particular good.

OPTICAL SPECTRUM: Includes those radiations, commonly called light, that can be detected visually. They are a type of electromagnetic radiation.

ORGANISM: Any living thing.

ORIENTATION: Position with relation to the compass.

OUTAGE: In a power system, the state of a component (such as a generating unit or transmission line) when it is not available to perform its function due to some event directly associated with the component.

OUTFALL: The mouth of a sewer, drain or conduit where an effluent is discharged into the receiving waters.

OUTPUT: The amount of power delivered from a generating station or stations during a specified period.

OVERBURDEN: Material of any nature which overlies a deposit of useful materials, ores or coal, especially those deposits that are mined from the surface.

OXIDANT: Any substance that can remove electrons from an atom or molecule. Photochemical smog is caused by light-induced oxidation reactions of pollutant molecules with components of the atmosphere. In many cases the oxidizing agent is atmospheric oxygen.

OXIDATION: A chemical reaction in which electrons are removed from an atom or molecule. Organic material is oxidized by the action of aerobic bacteria. Oxidation is used in waste water treatment to break down organic wastes.

OZONE (O_3): The kind of oxygen that has three atoms in each molecule. A pungent, colorless, toxic gas. Ozone is one component of photochemical smog and is considered a major air pollutant.

Write additional "O" words here:

P

PARTICULATES: Finely divided solid or liquid particles in the air or in an emission. Particulates include dust, smoke, fumes, mist, spray and fog.

PASSIVE SOLAR SYSTEM: See SOLAR, PASSIVE.

PAYBACK PERIOD: The time it takes for expected energy savings to recover the cost of investment; also called recovery rate.

PEAK LOAD: The maximum amount of power delivered during a stated period of time. The term is sometimes used to describe that portion of the load above the base load.

PEAKING: Power plant operation to meet the highest portion of the daily load.

PEAKING CAPABILITY: The maximum peak load that can be supplied by a generating unit, station, or system in a stated period of time. For a hydro-project the peaking capability would be equal to the maximum plant capability only under favorable conditions.

PEAT: The partially decayed plant matter found in bogs and swamps; one of the earliest stages of coal. The preserved remains of plants may be clearly seen in peat. It contains a high percentage of water, and has been used as a fuel for hundreds of years.

PENSTOCK: The water conduit in a dam that connects the intake to the turbine or water wheel.

PETROCHEMICALS: Chemicals made from components of crude oil and/or natural gas. The cracking process for the manufacture of gasoline produces large quantities of gaseous hydrocarbons which were at one time waste products used only as illuminants and fuels in the refinery.

PETRODOLLAR: Money flowing out of the country into the OPEC nations to pay for oil.

PETROLEUM (CRUDE OIL): A naturally-occurring material (gaseous, liquid or solid) composed mainly of chemical compounds of carbon and hydrogen. Fractional distillation yields gasoline, diesel, lubricating oil and other products.

pH: A way of expressing both acidity and alkalinity on a scale of 0-14, with 7 representing neutrality, numbers less than 7 increasing acidity and numbers greater than 7 increasing alkalinity.

PHASE: The relationship of two waves with one another. Waves that are "in phase" rise and fall together.

PHOTOCHEMICAL SMOG: Atmospheric pollution resulting from a complex series of chemical reactions involving organic substances and nitric oxides and initiated by ultraviolet light from the sun. Produces abnormal conditions and growth alterations in plants, and is an eye and respiratory irritant in humans.

PHOTON: Unit of light energy.

PHOTOSYNTHESIS: The process in which sunlight falling on green plants causes carbon dioxide and water to be converted into more complex organic materials such as glucose. Thus the process by which green plants convert radiant energy into chemical energy.

PHOTOVOLTAIC CELL: A device which produces an electric current from solar radiation. Materials which can be utilized in the production of photovoltaic cells are silicon, cadmium sulfide, and gallium arsenide.

PHOTOVOLTAIC PROCESS: The process by which radiant energy is converted into electric energy. Solar radiation striking certain materials is absorbed, causing separation of electrons from atoms. The migration of these electrons in one direction and of the positively charged ions in the other can produce a small potential difference, typically about 0.5 volts.

PHYSICS: The science dealing with the properties, changes and interactions of matter and energy.

PLENUM: A large duct used as a distributor of air from a furnace.

PLUME: A discharge of water (mist) or smoke from a power plant or other source.

PLUTONIUM (Pu): A heavy, radioactive human-made, metallic element with atomic number 94. Its most important isotope is fissionable plutonium 239, produced by neutron irradiation of uranium 238. It is used for reactor fuel and in weapons.

POINT SOURCE: In air pollution, a stationary source of a large individual emission, generally of an industrial nature. This is a general definition; point source is legally and precisely defined in federal regulations. See AREA SOURCE.

POLLUTION: The presence of matter or energy whose nature, location or quantity produces undesired effects upon the normally existing environment.

POSITRON: A positively charged electron.

POTENTIAL (ELECTRICAL): The amount of voltage capable of moving an electric charge from one point to another.

POTENTIAL ENERGY (GRAVITATIONAL): The amount of energy that could be released by an object falling, such as water on top of a dam.

POWER: The rate at which work is done or energy expended. It is measured in units of energy per unit of time, such as calories per second, and in units such as watts and horsepower. If an amount of work (W) is done in time (t) the power or rate of doing work is P=W/t.

POWER GAS: A mixture of carbon monoxide and hydrogen which has a low heat value. This low-BTU gas can be processed into methane, the chief component of natural gas.

POWER GRID: A network of electrical power lines and associated equipment used to transmit and distribute electric power.

POWER POOL: A power pool is two or more electric systems interconnected and coordinated to supply power in the most economical manner for their combined load requirements and maintenance.

PPM: Parts per million. The unit commonly used to represent the degree of pollutant concentration where the concentrations are small. Larger concentrations are given in percentages. Thus BOD is represented in ppm while suspended solids in water are expressed in percentages. In air, ppm is usually a volume/volume ratio; in water, a weight/volume ratio.

PREFERENCE CUSTOMERS: In accordance with congressional directives, cooperatives and public bodies (states, public utility districts, counties, municipalities, and federal customers) have preferential rights to federally generated hydro electrical power. These customers fall into two categories: (a) those that have no generating facilities of their own or other sources of power supply; and (b) those that supplement their own power resources with purchases from a federal system.

PRESSURE: The force per unit area.

PRESSURIZED WATER REACTOR: A reactor in which water, heated by nuclear energy, is kept at high pressure to prevent the water from boiling. Steam is then generated in a secondary coolant loop.

PRIMARY BENEFITS OR COSTS: Results which are directly related to a particular action.

PRIMARY ENERGY: Energy in its naturally-occurring form (coal, oil, uranium, etc.) before conversion to end-use forms.

PRIME ENERGY: Hydroelectric energy which is assumed to be available 100 percent of the time; specifically, the average energy generated during the critical period.

PRIVATE UTILITY: A utility owned by stock holders.

PRODUCERS: Organisms that utilize light energy to produce usable chemical energy; i.e. plants, autotrophs. The first trophic level on a pyramid of energy.

PRODUCTIVITY: The amount of energy fixed in chemical compounds in a particular period of time; usually measured by increase in biomass.

PROTON: An elementary particle found in the nucleus of all atoms. It carries a positive charge equal to the negative charge of the electron. The proton is, in effect, the positive nucleus of the hydrogen atom.

PUBLIC GOODS: Goods which, once they are provided to one individual, are provided to society as a whole. These goods cannot be subdivided and sold on the market by a private party.

PUBLIC UTILITY: A publically-owned corporation of a state with territorial boundaries embracing an area wider than a single municipality (frequently more than one county) whose purpose is generating, transmitting and distributing electrical power.

PUMPED HYDROELECTRIC STORAGE: The only means now available for the large scale storage of electrical energy. Excess electrical energy produced during a period of low demand is used to pump water up to a reservoir. When demand is high, the water is released to operate a hydroelectric generator.

PUMPED STORAGE PLANT: A hydroelectric power plant which generates electric energy for peak load use by utilizing water pumped into an elevated storage reservoir during off-peak periods.

PYROLYSIS: The transformation of a substance into another compound by the application of heat alone. In the context of energy, pyrolysis (also called destructive distillation) is the heating of organic materials such as coal, wood, petroleum, and solid wastes in the absence of oxygen with provisions for recovery of the desired combustible products. The principal products of pyrolysis are gases, oils, and char.

Write additional "P" words here:

Q

QUASAR: Celestial objects that emit immense quantities of light, of powerful radio waves, or both.

Write additional "Q" words here:

R

R-VALUE OR R-FACTOR: Resistance to heat flow, used with specific materials such as glass, wood, concrete block. The higher the R, the better the insulation.

RADIANT ENERGY: Any form of energy radiating from a source; i.e. sound, heat, electromagnetic waves, light, X-rays, gamma rays, etc.

RADIATION: Any high-speed transmission of energy in the form of particles or electromagnetic waves.

RADIOACTIVE ISOTOPE: An isotope with an unstable nucleus that stabilizes itself by emitting radiation.

RADIOACTIVE WASTE: Waste material which is hazardous because of the radiation it emits.

RADIOACTIVITY: The property possessed by some elements, such as uranium, of spontaneously emitting alpha, beta or gamma rays.

RADIOLOGY: The science dealing with X-rays and other forms of radiant energy, especially as used in medicine for X-raying bones, organs, etc. and for diagnosing and treating disease.

RADON: A radioactive gas which is formed by the decay of uranium and other radioactive materials.

RATIONING: The apportioning of energy resources by shares determined according to available supply.

REACTOR TRIP: An automatic procedure by which control rods are rapidly inserted into the core of a nuclear reactor to stop the chain reaction.

REACTOR VESSEL: A cylindrical, steel vessel that contains the core, control rods, coolant, and structures that support the core. In a pressurized water reactor, the vessel is approximately 8 inches thick.

RECLAMATION: Act or process of making a site habitable to organisms that were originally present or others that approximate the original inhabitants. The leveling and replanting of strip-mined land is an example of reclamation.

RECOVERABLE RESOURCE: That portion of a resource expected to be recovered by present-day techniques and under present economic conditions. Includes geologically expected but unconfirmed resources as well as identified reserves.

RECYCLE: To process what are often waste materials (i.e. liquid body waste, cans, glass, newspapers) in order to regain new material for human use.

REFINE: To cleanse or purify by removing undesired components; to process a material to make it usable.

REFINERY: An industrial plant which heats crude oil so that it separates into chemical components, which are then distilled off as more usable substances.

REFLECTION: The turning back of a wave from the boundary of a medium.

REFUSE: See SOLID WASTE.

REFUSE RECLAMATION: The collection and process of converting solid waste to saleable products. For example, the composting of organic solid waste.

REGENERATIVE BRAKING: Braking in which the energy is recovered either mechanically (in a flywheel, for example) or electrically. This energy can then be used in subsequent acceleration.

REM: The unit of measurement of the dose of radiation absorbed per unit mass (adjusted for the effectiveness in causing biological change).

RENEWABLE RESOURCES: Nondepletable resources; for example, the sun.

REPROCESSING: The chemical recovery of unused uranium and plutonium and certain fission products from spent fuel elements that have produced power in a nuclear reactor.

RESERVES: The amount of a natural resource known to exist and expected to be recovered by present-day techniques and under present economic conditions.

RESERVOIR: A pond, lake, tank, or basin (natural or human-made) used for the storage, regulation and control of water. A discrete section of porous rock containing an accumulation of oil or gas, either separately or as a mixture.

RESIDUE: Something that remains after a part is taken, separated or designated. For example, wood residue is used as a source of energy.

RESIDUAL HEAT REMOVAL SYSTEM (RHRS): A system designed to remove the small quantity of heat that continues to be produced by the core after the reactor is shut down and the fission process is terminated. The system normally operated during core cooldown and refueling operations.

RESISTANCE: That character of a conductor that impedes the flow of an electric current. Unit of measure is "ohms"

RESOURCES: The estimated total quantity of a natural resource such as minerals in the ground; includes undiscovered mineral reserves.

RESPIRATION: The oxidative breakdown and release of energy from fuel molecules.

RETORT: A vessel used for the distillation of volatile materials, as in the separation of some metals and the destructive distillation of coal; also a long semi-cylinder of fire clay or silica used in the manufacture of coal gas.

RETROFIT: To furnish with new parts or equipment not available at the time of manufacture.

REUSE: To use again, as in returnable soft drink bottles, or scraps of old clothes used in a quilt.

RSSF (RETRIEVABLE SURFACE STORAGE FACILITY): A place for burying unwanted radioactive materials to prevent radiation escape, with earth or water acting as a shield. Such materials must be placed in watertight, noncorrodible containers to prevent leakage.

RUN OFF: Snow melting in the spring causes rivers to rise. This is called "spring run off".

Write additional "R" words here:

S

SALINITY: The concentration of salt in water.

SCRAP: Discarded or rejected materials that result from manufacturing or fabricating operations and are suitable for reprocessing.

SCRUBBER: Equipment used to remove pollutants or particulate matter from effluent gases.

SEAM: A bed of coal or other resource of recoverable thickness.

SECONDARY BENEFITS OR COSTS: Results which are indirectly related to a particular action.

SECONDARY ENERGY: All hydroelectric energy other than prime energy; specifically the difference between average annual energy and prime energy.

SECONDARY RECOVERY: Oil and gas obtained by the augmentation of reservoir energy, often by the injection of air, gas or water into a producing formation.

SHALE: A fine-grained sedimentary rock formed by the hardening of clay. Splits into thin layers when broken.

SHIELDING: Material, such as lead or concrete, around a nuclear reactor used to prevent the escape of radiation to protect workers and equipment.

SILICON (Si): An element whose crystals can be utilized to manufacture photovoltaic cells.

SILTATION: The deposition of finely divided soil and rock particles upon the gravel of stream and river beds and in reservoirs.

SIMPLE MACHINE: A contrivance for the transfer of energy and for increased convenience in the performance of work.

SIMPLE PAYBACK: The length of time required for an investment in an energy-saving device to pay for itself; not adjusted for fuel price escalation.

SLURRY: A mixture of a liquid and a solid.

SMOG: A term originally applied to a combination of smoke and fog. Now commonly applied to a photochemical haze produced by light-induced oxidation reactions of pollutant molecules (automobile and industrial emissions) with components of the atmosphere.

SNOWPACK: The winter accumulation of snow in mountain areas which will melt and run off into streams and rivers.

SOLAR, ACTIVE SYSTEM: Energy from the sun used to generate electricity and to produce liquid or gaseous fuels. Active solar systems include windmills, hydroelectric energy, solar thermal energy conversion, biomass, ocean thermal energy conversion, and satellite power systems.

SOLAR BATTERY: A device of one or more units for converting the energy of sunlight into electrical energy.

SOLAR CELL: An electric cell which converts radiant energy from the sun into electrical energy by the photovoltaic process.

SOLAR COLLECTOR: A surface which by virtue of geometry or surface properties absorbs solar energy and imparts this energy to a heat-transfer fluid which circulates through the collector.

SOLAR ENERGY: Radiation energy from the sun falling upon the earth's surface.

SOLAR FURNACE: An optical device with large mirrors which direct the sun's rays to a small focal point to produce very high temperatures.

SOLAR HOUSE: A house designed to utilize solar energy for heating and cooling.

SOLAR INSOLATION (RADIATION): The amount of solar energy available at a location on a regular basis.

SOLAR PANEL: A battery of solar cells.

SOLAR, PASSIVE SYSTEM: A means of capturing, storing, and using heat from the sun.

SOLAR POWER: Useful power derived from solar energy.

SOLID: A state of matter in which the relative motion of the molecules is restricted and they tend to retain a definite fixed position relative to each other, giving rise to crystal structure. A solid may be said to have a definite shape and volume.

SOLID WASTE: Useless, unwanted, or discarded materials with insufficient liquid content to be free flowing.

SOLVENT REFINED COAL (SRC): A tar-like fuel produced from coal when it is crushed and mixed with a hydrocarbon solvent at high temperature and pressure. It is higher in energy value and contains less sulfur or ash than coal.

SOUND ENERGY: A type of energy in which waves are carried by the transmission of mechanical vibrations through air, water or solids.

SPECIFIC HEAT: The heat capacity of a material per unit mass. The amount of heat (in calories) required to raise the temperature of one gram of a substance $1^{o}C$; the specific heat of water is 1 calorie.

SPEED: The distance traveled per unit of time.

SPENT FUEL: Nuclear fuel, containing fission products, that can no longer economically sustain a chain reaction.

SPENT FUEL PIT: A pit constructed of reinforced concrete used for the underwater storage of spent fuel assemblies after their removal from the reactor core.

SPENT SHALE: Any shale which has been retorted to recover the oil. The variety of retorting methods results in an equally broad variety of spent shales which may resemble anything from cinders to fine coal dust because of the amount of heat involved and the amount of free carbon that may be left.

SPILLWAY: The channel or passageway around or over a dam through which excess water is diverted.

SPOT MARKET: The price of energy commodities (usually oil) which are sold on a one-time basis for immediate delivery.

STABLE AIR: An air mass that remains in the same position rather than moving in its normal horizontal and vertical direction. Stable air does not disperse pollutants and can lead to high build-ups of air pollution.

STACK GASES: Gaseous substances emitted from power-plant smoke stacks during burning of fuel.

STAGNATION: Lack of wind in an air mass or lack of motion in water. Both cases tend to entrap and concentrate pollutants.

STATIC ELECTRICITY: Unbalanced, stationary electric charges.

STEAM: The vapor that forms when water is heated to the boiling point. Jets of steam are capable of driving the pistons in a piston engine or turning the blade of a turbine.

STEAM, DRY: A steam that is so hot that no water droplets are present in it.

STEAM-ELECTRIC PLANT: A plant in which the prime movers (turbines) connected to the generators are driven by steam.

STIRLING ENGINE: An external combustion engine in which air (or hydrogen in the newer versions) is alternately heated and cooled to drive the piston up and down. It is claimed to be non-polluting and more efficient than the internal combustion engine.

STOCKPILE: A storage pile or reserve supply of an essential raw material. For example, coal is stockpiled in the open air for storage purposes.

STORAGE CELL: An electrochemical cell in which the reacting materials are renewed by the use of a reverse current from an external source; for example, an automobile storage battery.

STORM DOOR: Additional door with an air space between it and the existing door.

STORM WINDOW: Additional window with an air space between it and the existing window. Storm windows will cut in half the heat that passes through windows in a house.

STRATIFIED CHARGE ENGINE: An engine in which the amount of charge (fuel plus air) is adjusted to engine conditions, directed to the area where it will burn best and fired at just the precise instant for optimum combustion.

STRIP-MINING: A process in which rock and top soil strata overlying ore or fuel deposits are scraped away by mechanical shovels. Also known as surface mining.

STRIPPER WELL: A nearly depleted well for which income barely exceeds expense.

SUBLIMINATION: The change of phase from a solid directly to a vapor or gas.

SUBSIDENCE: A sinking down of a part of the earth's crust, sometimes the result of underground mining excavations.

SUBSTATION: An electrical power station which serves as a control and transfer point in an electrical transmission system.

SULFUR CONTENT: The amount of sulfur (in various forms) which is contained in a fuel and often released upon combustion into the atmosphere as a sulfuric oxide.

SULFUR DIOXIDE (SO_2): An air pollutant generated principally from combustion of fuels containing sulfur.

SUPERCONDUCTOR: A material which, when cooled near absolute zero, has no electrical resistance. Superconducting transmission lines can carry electrical power without loss; superconducting coils can store large amounts of electrical energy.

SUPERTANKERS: Extremely large oil tankers that can hold up to four million barrels (170 million gallons) of oil. The largest ones will require deep-water ports.

SURFACE MINING: See STRIP MINING.

SWEETENING: The process by which petroleum products are improved in odor and color by oxidizing or removing the sulfur-containing and unsaturated compounds.

SYNCRUDE: Synthetic crude oil derived from coal or oil shale.

SYNTHESIZE: To form by bringing together separate parts; the formation of a complex compound by the combining of 2 or more simpler compounds or elements.

SYNTHETIC: Human-made.

SYNTHETIC FUEL: Gaseous or liquid hydrocarbon material produced from solid carbonaceous material.

SYNTHETIC NATURAL GAS (SNG): A gaseous fuel manufactured from coal. It contains almost pure methane (CH_4) and can be produced by a number of coal gasification schemes.

SYSTEM EFFICIENCY: The cumulative efficiency of a process from extraction of the resource through transporting, processing, and use to the end use.

Write additional "S" words here:

T

TAR SAND: A sedimentary material that contains bitumen or other heavy petroleum material that cannot be recovered by conventional petroleum recovery methods.

TECHNOLOGY: Applied science.

TEMPERATURE: The degree of hotness or coldness measured on a definite scale. Specifically, the temperature of a substance is a manifestation of the speed of molecular movement.

TENSILE STRENGTH: The greatest longitudinal stress a substance can bear without tearing apart.

TERTIARY RECOVERY TECHNIQUES: Use of heat and other methods to augment oil recovery (presumably occurring after secondary recovery).

THERM: A unit of gas fuel with a heat value of 100,000 BTUs.

THERMAL BARRIER: A strip of nonconducting material such as wood, vinyl, or foam rubber, separating the inside and outside surfaces to stop conduction of heat to the outside and resulting cold surfaces inside.

THERMAL BREEDER: A breeder reactor which operates with neutrons in the thermal energy range (neutrons with energies less than 1 electron volt).

THERMAL CRACKING: The process of subjecting less volatile heating oil fractions to higher temperatures under increasing pressure. This causes the larger, complex molecules to break up into smaller ones, including those in the gasoline range.

THERMAL EFFECTS: A term used to describe the impact of heat on a body of water.

THERMAL EFFICIENCY: The ratio of the electric power produced by a power plant to the amount of heat produced by the fuel; a measure of efficiency with which the plant converts thermal to electrical energy. Commonly about 35%.

THERMAL ENERGY: The total potential and kinetic energy associated with the random motions of the particles of a material.

THERMAL PLANT: A generating plant which converts heat energy to electrical energy. Such plants may burn coal, oil, or use nuclear energy to produce thermal energy.

THERMAL POLLUTION: Degradation of water quality by the introduction of a heated effluent. Primarily a result of the discharge of cooling waters from industrial processes, particularly from electrical power generation. Also "waste heat" which eventually results from virtually every energy conversion.

THERMAL REACTOR: A nuclear reactor in which the chain reaction is sustained primarily by thermal neutrons. Most commercial nuclear reactors are thermal reactors.

THERMAL STORAGE: A system which utilizes ceramic brick and other materials to store heat energy.

THERMODYNAMICS: The science and study of the relationships between heat and mechanical work. First Law: Energy can be neither created nor destroyed. Second Law: Energy cannot be converted from one form to another without loss.

THERMOMETER: An instrument used to measure heat.

THERMOSTAT: An automatic device for regulating the temperature of a heating or cooling unit.

THORIUM (Th): A naturally radioactive element with atomic number 90 and, as found in nature, an atomic weight of approximately 232. The fertile thorium 232 isotope is abundant and can be changed to fissionable uranium 233 by neutron irradiation.

THREE MILE ISLAND: A nuclear reactor facility near Harrisburg, Pennsylvania, which experienced a serious nuclear incident during the spring of 1979.

TIDAL POWER: A form of power obtained from the filling and emptying of a bay or an estuary that can be closed by a dam. The enclosed basin is allowed to fill and empty only during brief periods at high and low tides in order to develop as much power as possible.

TON: A unit of mass equal to 2,000 pounds ("short ton") in the U.S., Canada and the Union of South Africa and to 2,240 pounds ("long ton") in Great Britain. The metric ton (1,000 kilograms) equals 2,204.62 pounds.

TOPPING CYCLE: A means of using high-temperature heat energy that cannot be used in a conventional steam turbine. A gas turbine, for example, might operate as a topping cycle on furnace gases of 2,000°F and its exhaust could then heat steam for a turbine operating at 1,000°F.

TOTAL ENERGY SYSTEM: A packaged energy system of high efficiency, utilizing gas fired turbines or engines which produce electrical energy and utilize exhaust heat in applications such as heating and cooling.

TOXICITY: The degree of being poisonous or harmful to plant or animal life.

TOWER OF POWER: A conceptual method of producing electrical energy from solar rays. It involves the focusing of a large number of rays on a single source (boiler), usually located on an elevated tower, to produce very high temperatures. A fluid located in or passed through the source is consequently transformed to steam and utilized in a turbine generator to produce electrical energy.

TRANSFORMER: A device which can increase or decrease the voltage of an alternating current.

TRANSMISSION: The act or process of transporting electric energy in bulk from a source or sources of supply to other utility systems. Done at high voltage to reduce loss.

TRANSMISSION LINES: Wires or cables through which high voltage electric power is moved from point to point.

TRITIUM: A radioactive isotope of hydrogen in which the nuclei of the hydrogen atoms contain one proton and two neutrons. It will be used as a fuel in the early fusion reactors.

TROPHIC LEVELS: Steps in a food chain from producers through consumers, or from plants to herbivores to carnivores.

TROPOSPHERE: The layer of the atmosphere extending seven to ten miles above the earth. Vital to life on earth, it contains clouds and moisture that reach the earth as rain or snow. Temperature decreases as altitude increases in the troposphere. Storms and vertical air currents and clouds occur almost entirely in the troposphere.

TURBINE: A motor, the shaft of which is rotated by a stream of water, steam, air or fluid from a nozzle and forced against blades of a wheel.

TURBOGENERATOR: An electric generator powered by a gas jet or steam turbine engine. The steam is created by heat from combustible materials (coal, oil, natural gas or other) or from a heat source beneath the earth's surface (geothermal).

Write additional "T" words here:

U

ULTIMATE RECOVERABLE RESERVES: The total quantity of crude oil, natural gas, natural gas liquids or sulfur estimated to be ultimately producible from an oil or gas field as determined by an analysis of current engineering data. This includes any quantities already produced up to the respective date of the estimate.

UNIT TRAIN: An ore shuttle that carries coal non-stop from mine to power plant.

URANIUM: A heavy, naturally occurring radioactive element of atomic number 92. Its most common isotope, 238_U, is not fissionable. The isotope 235_U (0.7% of the natural ore) is fissionable and is used as a fuel in nuclear reactors.

URANIUM, ENRICHED: Uranium in which the amount of the fissionable isotope 235_U has been increased above the 0.7 percent contained in natural uranium. Enriched fuel is more able to sustain a chain reaction and is normally used as the fuel for a nuclear power plant.

URANIUM TAILS: Depleted uranium derived as a by-product of uranium enrichment. Depleted uranium has a smaller percentage of 235_U than the 0.7 percent found in natural uranium.

URBAN PLANNING: Cooperative planning which may result in conservation and improved livability of an urban area.

USE: Fills a need or gives benefit or advantage; putting to service.

UTILITY: Public or private agency which provides a service; i.e. electrical energy.

U VALUE (THERMAL TRANSMITTANCE): Overall coefficient of heat transmission (air to air) expressed in BTUs per square foot per degree F. It is the time rate of heat flow. The lower the "U" value, the less heat transferred.

Write additional "U" words here:

V

VALENCE ELECTRONS OF THE ATOM: Electrons which are gained, lost, or shared in chemical reactions.

VAPOR: The words vapor and gas are often used interchangeably. Vapor is more frequently used for a substance which, though present in gaseous phase, generally exists as a solid or liquid at room temperature. Gas is more frequently used for a substance that generally exists in the gaseous phase at room temperature.

VAPOR BARRIER: A part of the insulation system in a residential or commercial structure. Vapor barriers prevent moisture from accumulating and causing rot in wood framing.

VAPORIZATION: The change of a substance from a liquid or solid state to the gaseous state. One of the factors contributing to air pollution.

VAPOR PRESSURE: The pressure at any given temperature of a vapor in equilibrium with its liquid or solid form.

VARIANCE: Sanction granted by a governing body for delay or exception in the application of a given law, ordinance or regulation.

VELOCITY: The distance traveled in a certain direction per unit of time. Velocity differs from speed in that the direction of motion is also specified.

VOLATILE: Readily vaporizable at relatively low temperature. Explosive. Characterized by rapid change.

VOLT: A unit of electrical pressure which forces electrical charges to move through conductors. One volt will force one ampere of current to move through a resistance of one ohm.

VLCC: Very large crude carriers. (See SUPERTANKERS).

Write additional "V" words here:

W

WASTE DISPOSAL (NUCLEAR): Often applied to problems encountered in neutralizing or getting rid of radioactive waste materials.

WASTE HEAT: Unwanted heat released to the environment through energy conversions.

WASTES, RADIOACTIVE: Equipment and materials from nuclear operations which are radioactive and for which there is no further use.

WATERFLOODING: A secondary-recovery operation for oil fields in which water is injected into a petroleum reservoir to bring more oil to the surface.

WATER POLLUTION: The addition of sewage, industrial and institutional wastes or other harmful or objectionable material to water in concentration or in sufficient quantities to result in measurable degradation of water quality.

WATER QUALITY STANDARD: A plan for water quality management containing four major elements: the use (recreation, drinking water, fish and wildlife propagation, industrial or agricultural) to be made of the water; criteria to protect those uses; implementation plans (for needed industrial municipal waste treatment improvements) and enforcement plans; and an anti-degradation statement to protect existing high quality waters.

WATERSHED: The area drained by a given stream.

WATER SUPPLY SYSTEM: The system for the collection, storage, treatment and distribution of potable water from the sources of supply to the consumer.

WATER VAPOR: Water in the form of a gas.

WATER WHEEL: An early device utilized to transform the energy of flowing water into mechanical power.

WATT: A metric unit of power, usually used in electric measurements, which gives the rate at which work is done or energy expended. One watt equals one joule of work per second. Stated in another manner, one watt is the work done when an electrical force of one volt pushes 6×10^{18} electrons through a resistance of one ohm in one second.

WATT-HOUR (Wh): A unit of energy; the amount of electric energy used by one watt in one hour. A 100 watt light bulb will use 100 watt-hours of electric energy each hour it is in use.

WAVE MACHINE: A device for converting the energy of the ocean waves into electrical energy. The first wave machine was invented in 1909.

WEATHERSTRIPPING: Reduces the rate of air infiltration by making sure that all doors and windows fit their frames snugly.

WEATHER VANE: An instrument used to determine wind direction.

WEIGHT: The force an object exerts on Earth. This force is proportional to the mass of the object and the gravitational field of Earth.

WEIR METHOD: A method of determining the flow rate of a stream.

WELL HEAD: Oil or gas brought to the surface, ready for transportation to refinery or ship or pipeline. Well head costs usually refer to the cost of bringing oil or gas to the surface and do not include costs of transportation, refining, distribution, or profit.

WELL STIMULATION: The use of secondary recovery methods such as waterflooding to increase the production rate of crude oil from a well or to prolong the useful life of the well.

WHEELING: Transmission of electric power by a utility over its lines for another utility.

WILDCAT: A well drilled in an area which has not produced gas or oil previously; usually exploratory, and often without geophysical investigation.

WINDFALL PROFIT: An unearned profit; one that is realized through no overt action of the beneficiary.

WIND GENERATORS: Devices designed to transform wind energy into electrical energy.

WINDMILL: Machine for doing useful work utilizing the energy of wind.

WORK: The transfer of force from one body or system to another. Work is performed by a force moving an object.

WORKING FLUID: Material, usually a gas or a liquid, where the absorption of heat and expansion drives a heat engine. Steam is the "working fluid" of a steam engine.

Write additional "W" words here:

X

X-RAYS: Highly energetic electromagnetic radiation produced when electrons impinge on metallic surfaces. Have the property to penetrate solid matter and to expose photographic film.

Write additional "X" words here:

Y

YELLOW CAKE: A product of the milling process which contains approximately 85% uranium oxide.

Write additional "Y" words here:

Z

ZERO, ABSOLUTE: The temperature which defines the absence of heat.

ZERO POPULATION GROWTH: State in which birth rate equals death rate.

ZIRCONIUM: A metallic element, highly resistant to corrosion, used as cladding on nuclear fuel elements.

ZONE CONTROL: Independent temperature control for each area to be heated and cooled with appropriate distribution control.

Write additional "Z" words here:

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